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SEPTEMBER, 1951

WARREN'S Stabilized

NATURAL GASOLINE

STA-VOL-ENE

any Way You Want it

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Butane
Iso-Pentane
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Heptane
Heavy Naphtha
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To aid the refiner in meeting the increasing demand for more and better motor fuel, all methods are available to transport WARREN'S STABILIZED Natural Gasoline when and where you need it. And you can depend upon STABILIZED Natural Gasoline for the essential elements of high octane rating, greater volatility, low front end. You can be ready for any demand in any season when you rely upon WARREN.

We manufacture special high octane blending agents which command higher prices but will help solve your octane problems.

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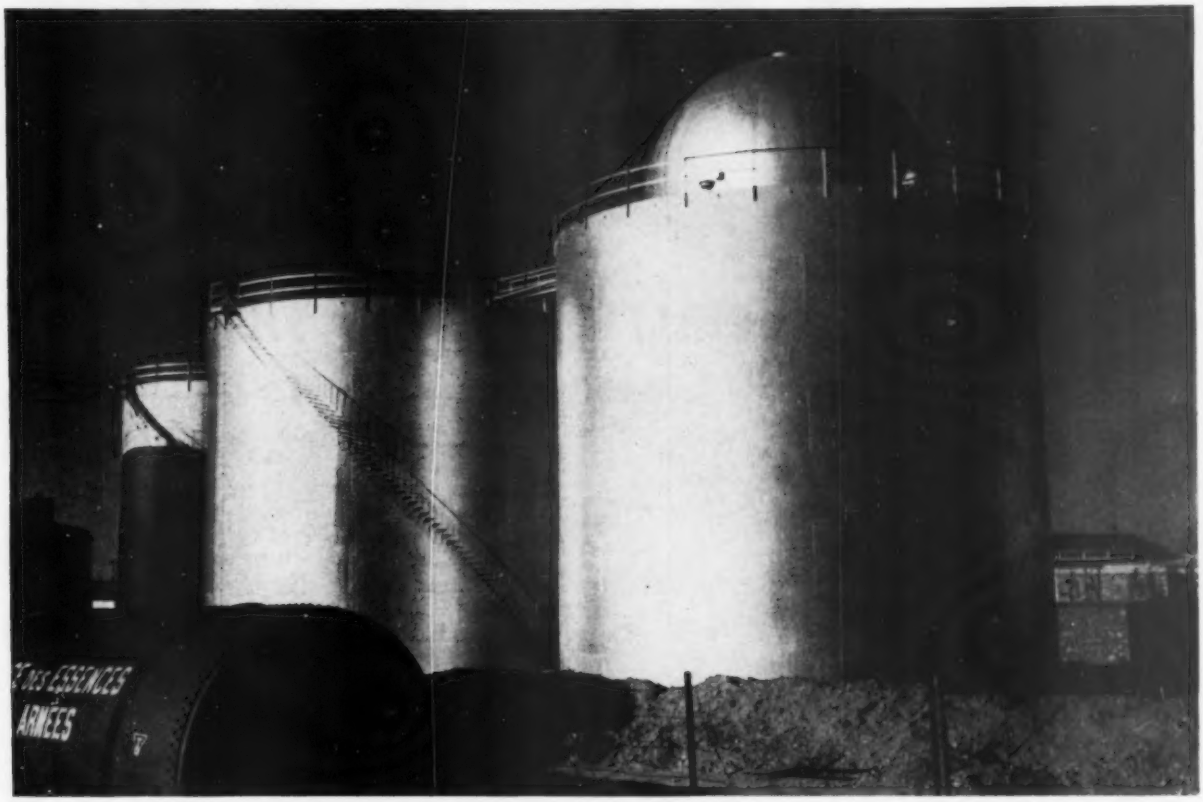
Crude Oil, Natural Gasoline and Liquefied Petroleum Products

HORTONDOME ROOF STOPS BREATHING LOSSES IN FRENCH MOROCCO



This particular Hortondome Roof is installed on a 50-ft. diam. by 48-ft. tank at Port Lyautey, French Morocco.

The simplicity of the design and operation of the Hortondome Roof make it one of the thriftiest vapor-saving units in the Horton line. Here is the secret of its effective performance.

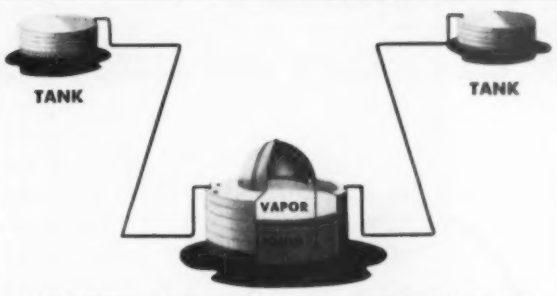
The Hortondome is a welded steel dome at the center of the tank roof. A flexible membrane made of a tough, durable fabric, coated on both sides with petroleum resistant synthetic rubber, is fastened at its outer edge to the equator of the dome. As vapor in the tank expands, this impervious membrane moves upward to make room for the expanding vapor without venting it to the atmosphere.

Check these advantages to see how the highly efficient, flexible Hortondome Roof can help you.

Dependable Operation: Complete protection of all moving parts from wind and weather and simplicity of vents, gauges and other tank fittings insures continuous and dependable operation of the Hortondome Roof at all times. The Hortondome Roof becomes an integral part of the tank without interfering with the regular operation of the tank.

Low Operating Costs: The Hortondome Roof operates automatically by natural forces. There are no operating costs involved, aside from ordinary maintenance.

Fire Safety: The Hortondome Roof and the vapor lines are filled with an air-vapor mixture having a percentage of vapor that far exceeds the upper flammable limit. Danger of fire in the system is therefore remote. Since venting is reduced, the danger of fire from exterior sources is minimized.



Hortondome Roofs can be used to prevent breathing evaporation losses from adjacent cone roof tanks. The vapor spaces of several cone roof tanks can be connected to the Hortondome Roof to form a vapor-saving system.

Regardless of location, Hortondome Roofs can mean many extra quality and safety benefits for you. Write our nearest office for further information on Hortondome Roofs.

CHICAGO BRIDGE & IRON COMPANY

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CALTEX
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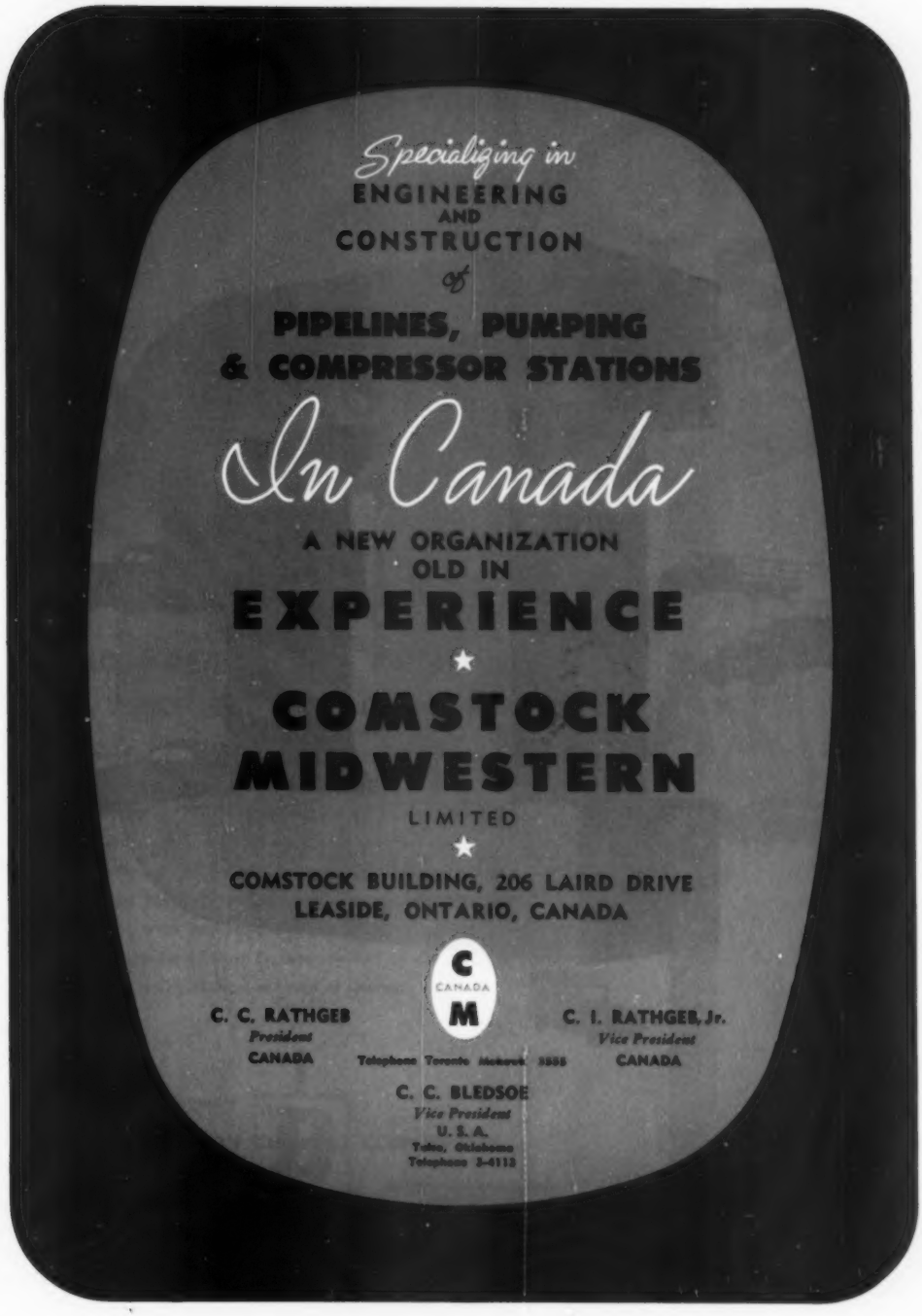
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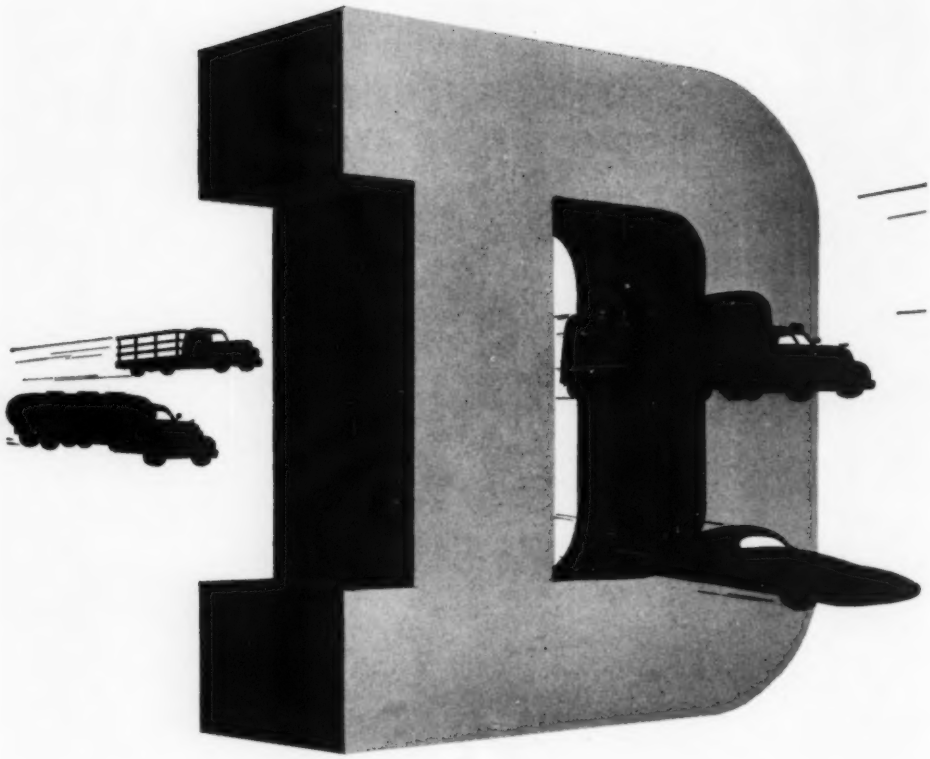

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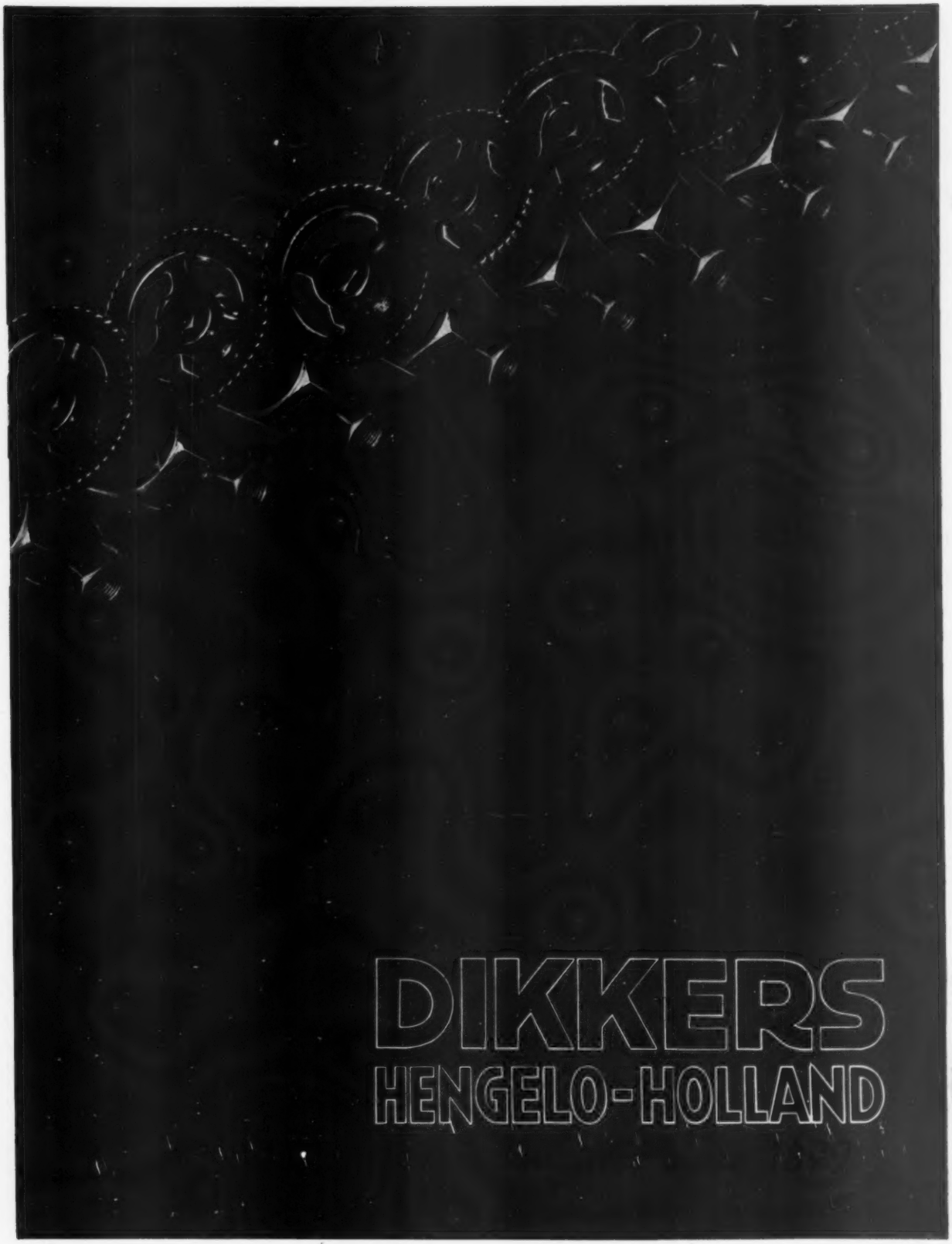
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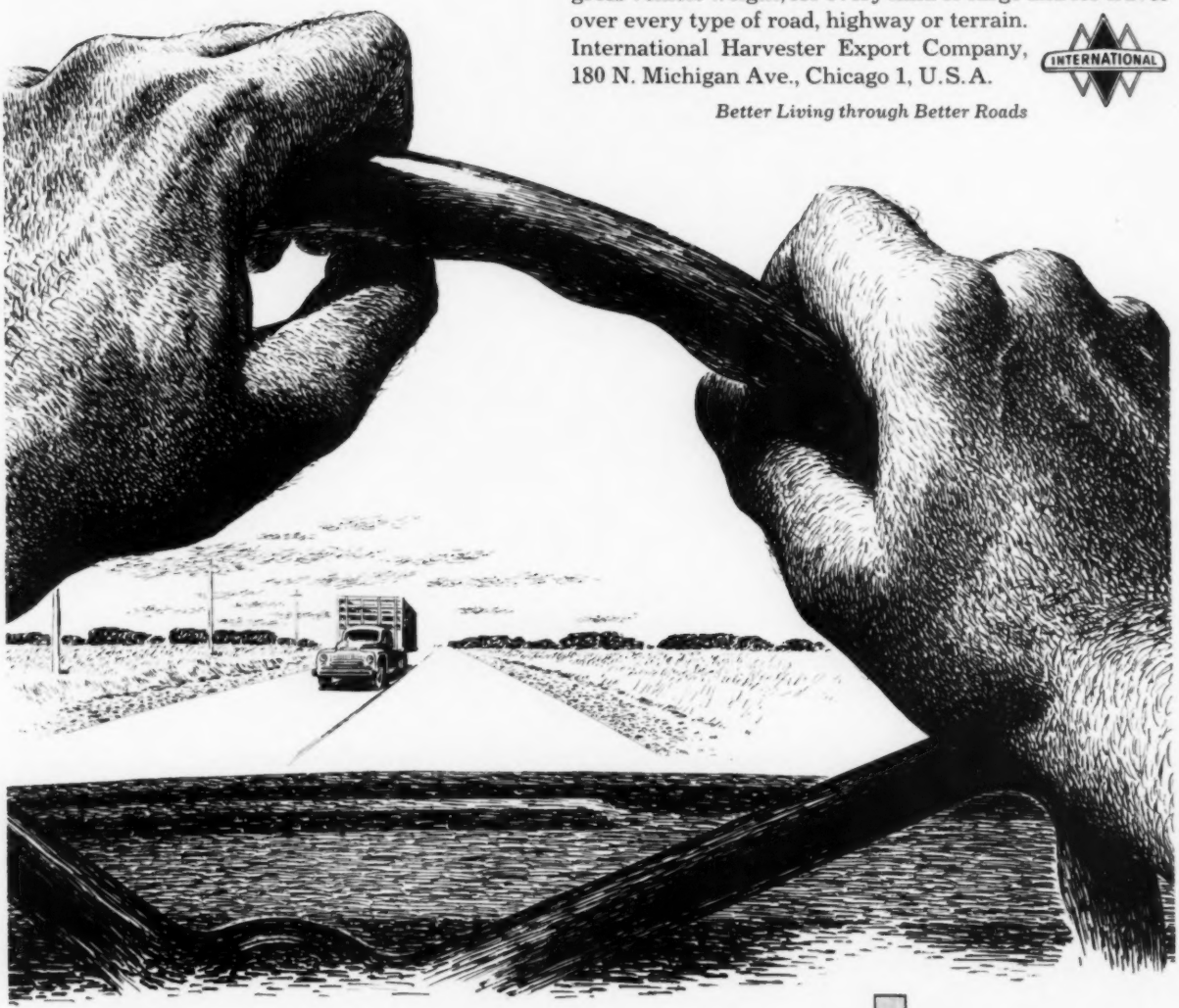

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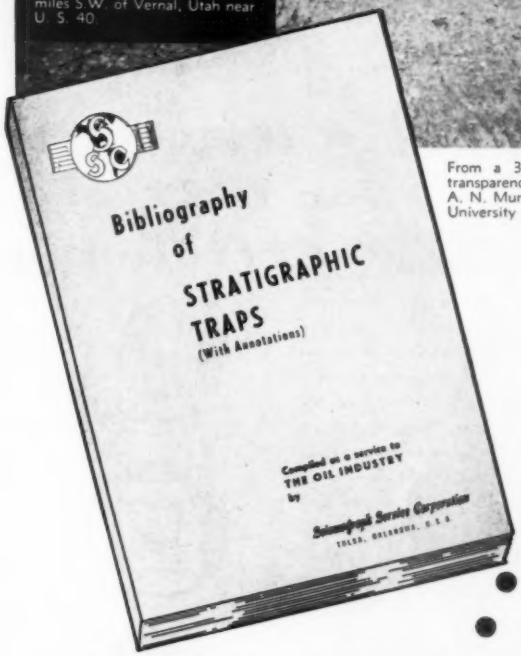
A channel sandstone in the upper part of Duchesne River formation (Oligocene) about 5 miles S.W. of Vernal, Utah near U. S. 40.

From a 35mm. Kodachrome transparency—Courtesy of Dr. A. N. Murray, Dept. of Geol., University of Tulsa.



Seismograph Service Corporation takes great pleasure in announcing the above bibliography. Its gratis distribution is another example of SSC's unexcelled service to the Oil Industry.

THE GEOLOGIST

In view of the increasing importance of Stratigraphic Traps in the search for oil the geologist may wish to review the pertinent literature.

THE GEOPHYSICIST

The geophysicist may wish to reacquaint himself with the various types of Stratigraphic Traps and their possible geophysical expressions.

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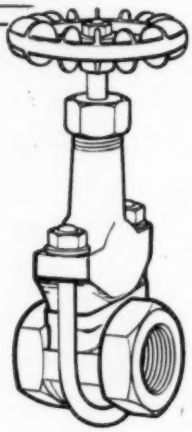

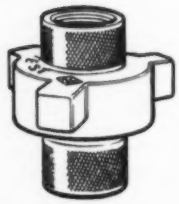

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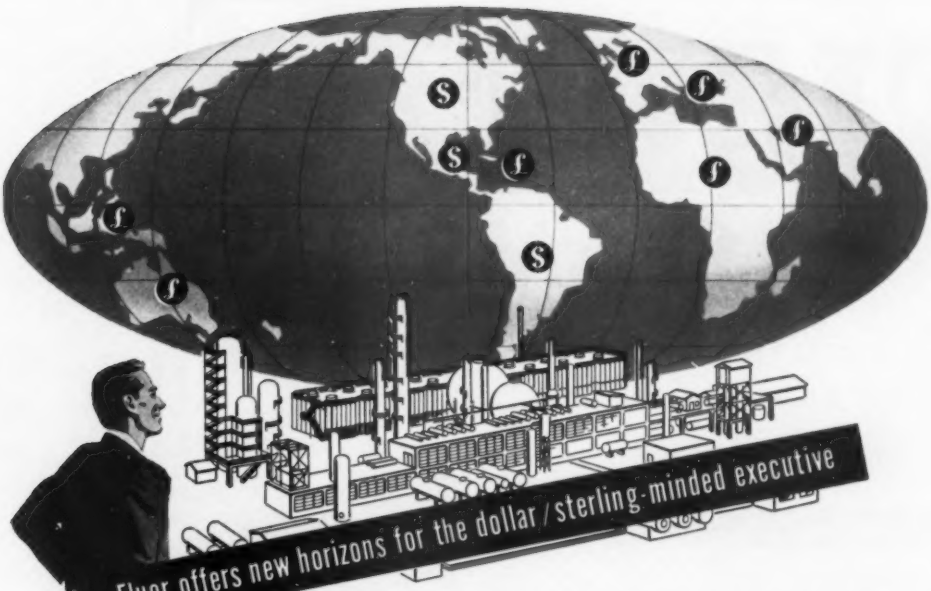

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TO FACILITATE the building of petroleum, chemical and auxiliary plants in the sterling and other areas, The Fluor Corporation, Ltd., takes this opportunity to remind you of its association with Head Wrightson Processes Ltd., a British Engineering Organization, currently engaged in the engineering, supply and erection of units for Light Oil and Crude Oil Fractionation, Gas Separation, Solvent Extraction, Chemical Treating, Utilities Supply, Carbon Black Production, etc., within the British Commonwealth and other countries.

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Products and Services offered to the investor under the association between The Fluor Corporation, Ltd., and Head Wrightson Processes Ltd., are payable in some cases entirely in sterling or, in other cases, largely in sterling with a minimum of dollars involved.

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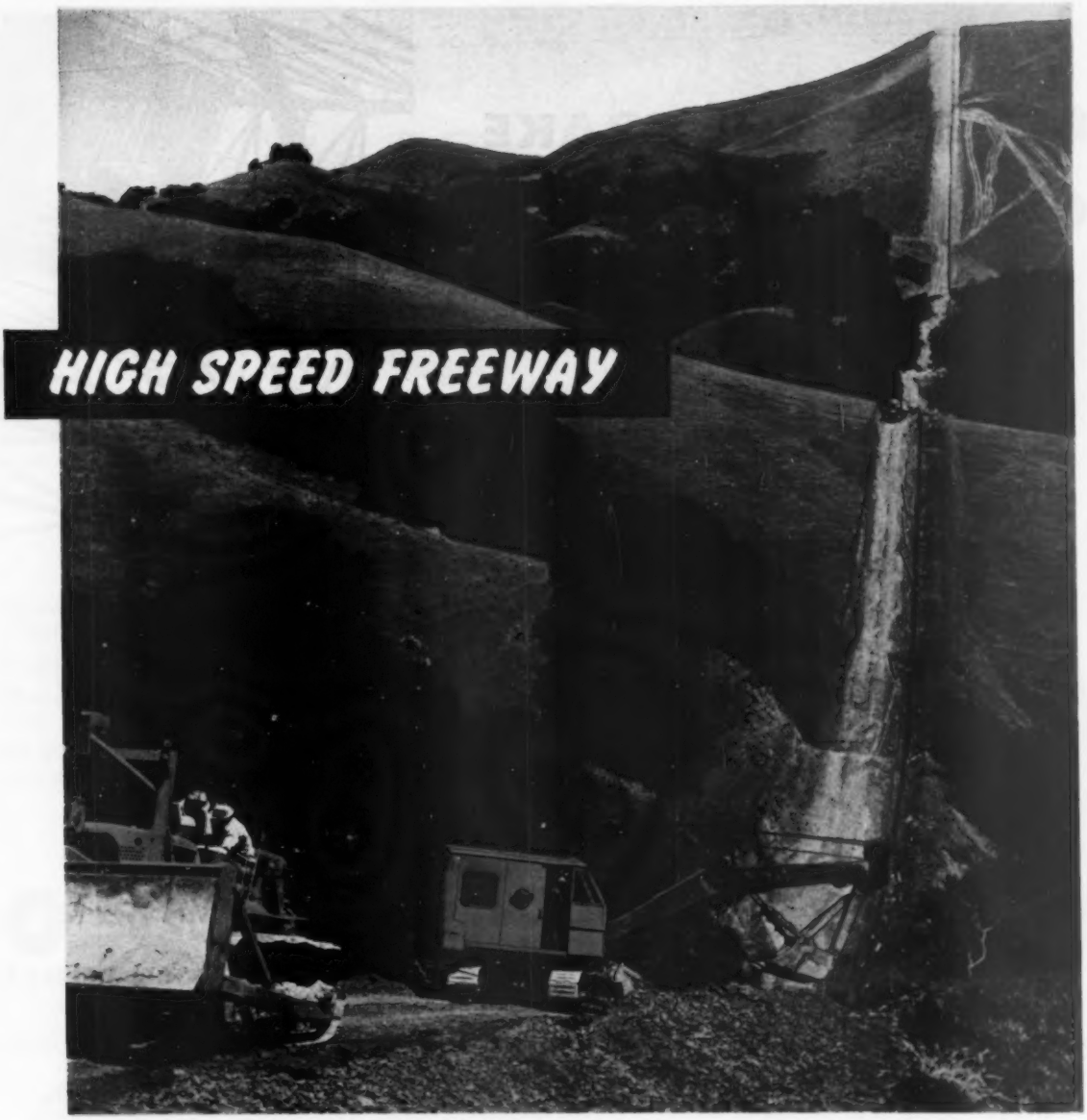

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Grades so steep that equipment required anchoring did not slow progress on this pipe line, engineered and built for General Petroleum Corporation—40 miles completed in 40 working days, San Ardo to Estero Bay, California.

Thorough planning, spreads engineered to fit job conditions and crack teams under experienced leadership are reasons why

Bechtel builds faster.

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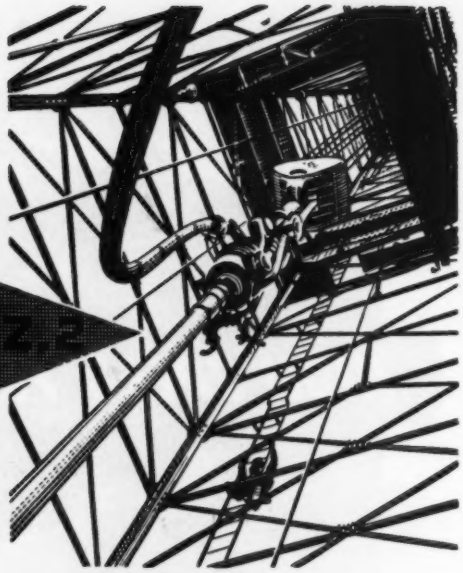

In drilling operations very heavy duty devolves on the draw-works brakes as the weight of the pipe increases with every length added.

Ferodo Industrial Linings possess those qualities essential to withstand the gruelling work imposed upon them in oil well drilling: coefficients of friction to meet wide variations in operating conditions, high resistance to scoring and exceptionally long life, thus avoiding the necessity for frequent renewals with consequent loss of working hours. Fit Ferodo Linings and "put the brake" on operating costs.

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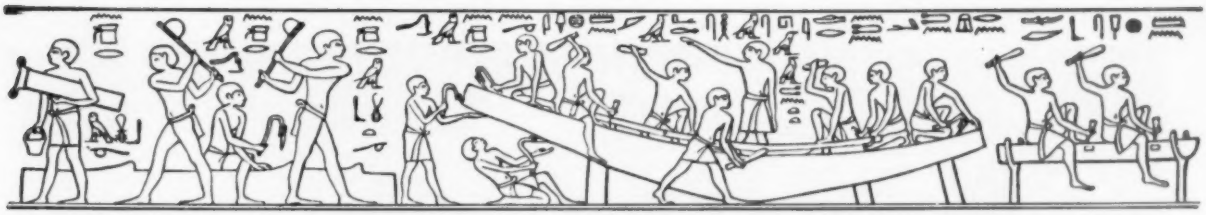

HIEROGLYPHICS · · · *with a modern meaning*

The workman of ancient Egypt knew the symbols of his trade. They helped him fashion stone and metal, wood and cloth, into the goods and structures which best served his era . . . The needs of our modern industrial civilization are different. Visitors to Sun Ship's mighty shops see in the making the intricate steel fabric of petroleum refineries and chemical plants . . . massive bubble towers, pressure vessels, condensers, cracking cases, and a vast array of special machinery and equipment for many industries.

But even a visitor from the days of Egypt's Pharaohs would recognize two familiar facts—that strange modern "hieroglyphics" guide precise assembly of today's steel behemoths . . . and that Sun Ship workers are masters in their knowledge of the symbols and crafts of their trades . . . The many modern industries served by Sun know these facts, too.

Illustration at top, reproduced from "The History of All Nations," shows ancient Egyptian shipbuilding as depicted on the tomb of Ti, at Sakkara. In contrast is the 55' regenerator being built by Sun.

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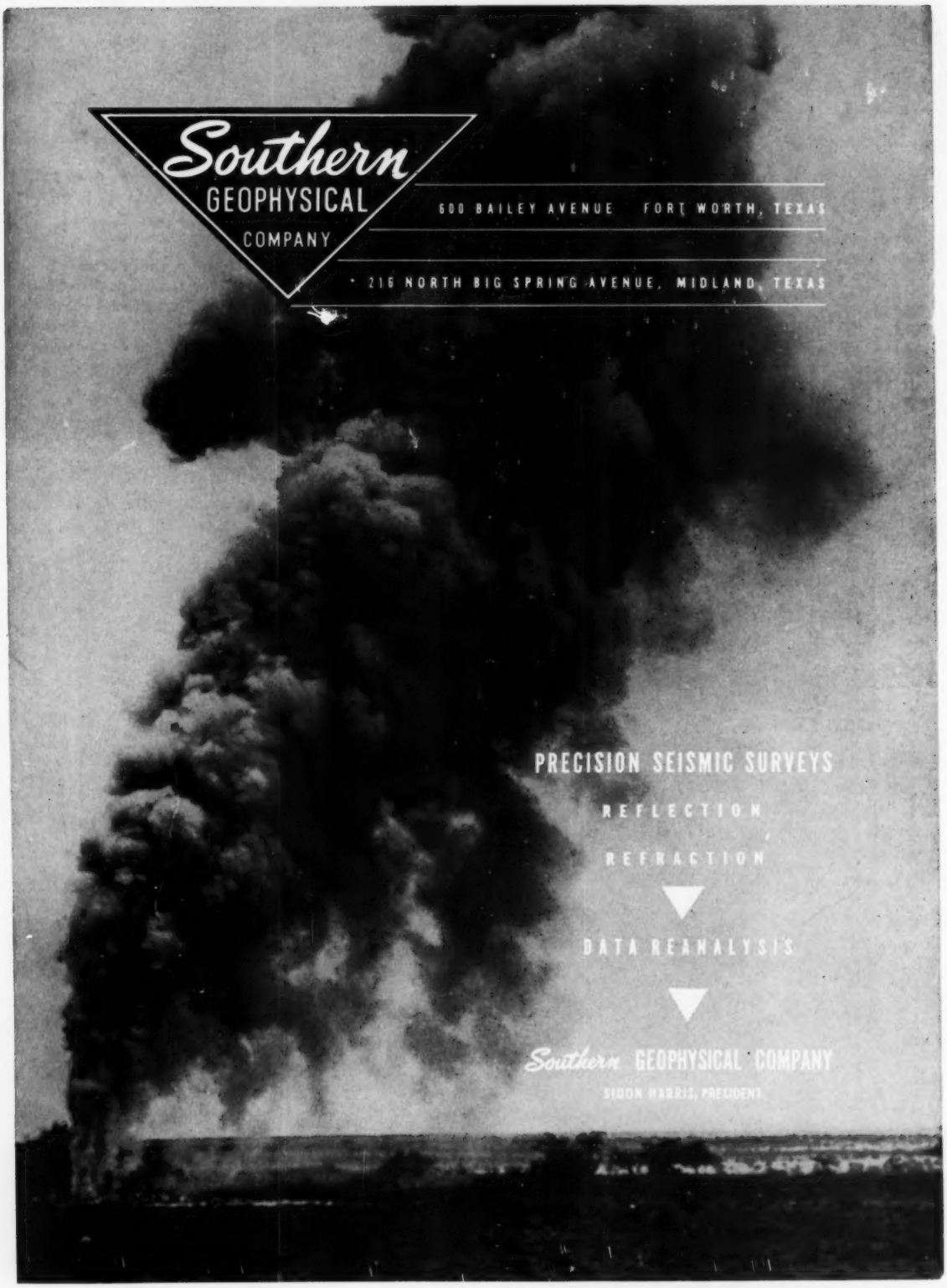
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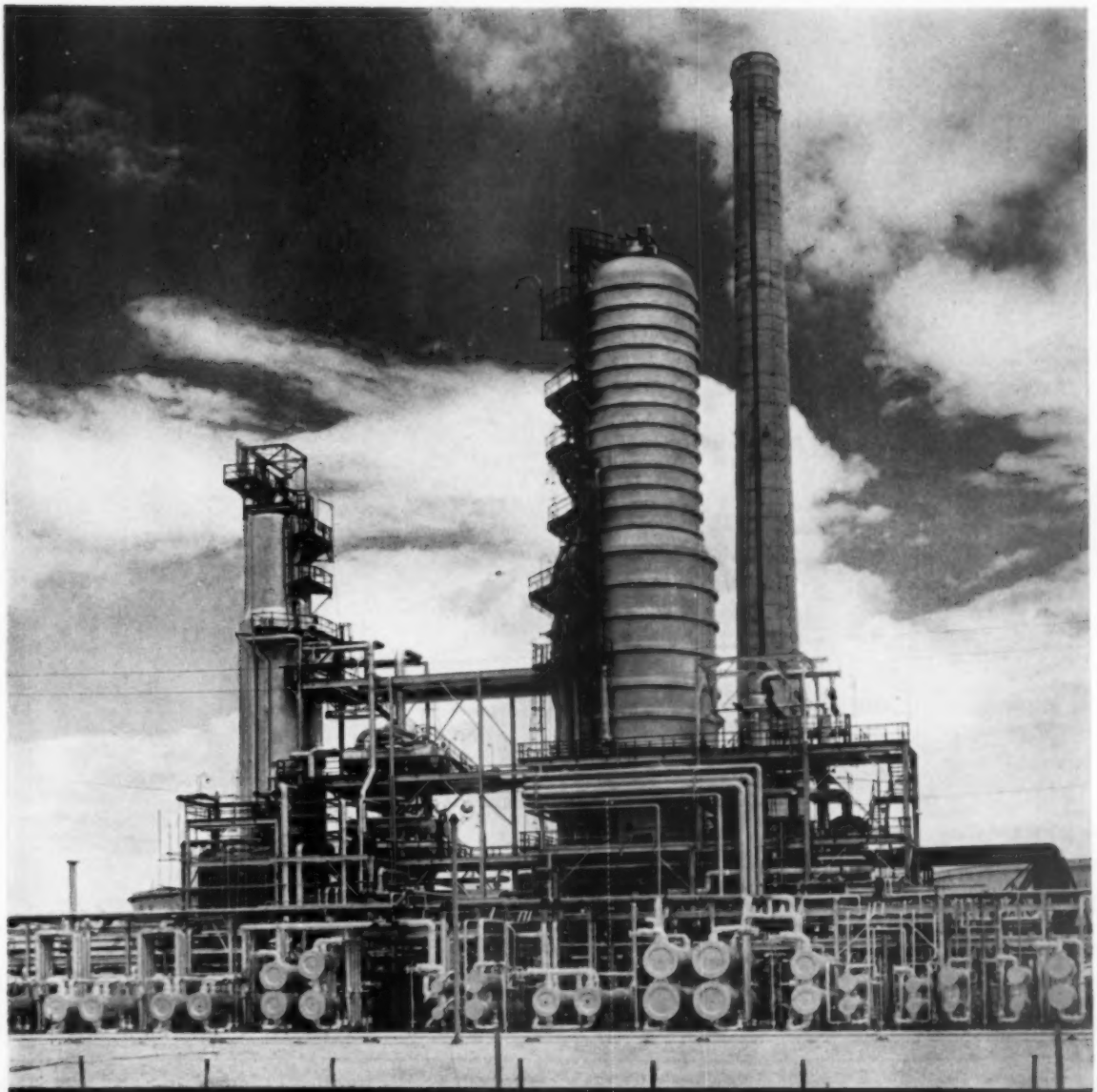

"On Stream" at Fawley

This 60,000 barrel per day two-stage crude installation unit and the 66,000 barrel per day single-stage crude unit are "on stream" at the new refinery of the Esso Petroleum Company Limited at Fawley, England. . . . They are but two of 14 process units being built at this new refinery—the largest in Europe—by Foster Wheeler, the overall contractor on the entire refinery project.

FOSTER WHEELER CORPORATION

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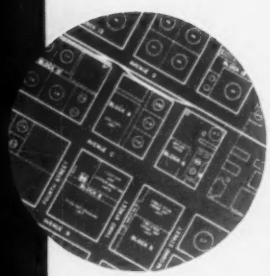
one contractor



From plot plan to complete refinery, a Foster Wheeler contract provides experienced engineering service for every detailed step in the sequence of design, procurement, fabrication and construction.

...more than **500** process units have been designed and constructed by Foster Wheeler in over 30 years service to the petroleum and chemical industries.

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PETROLEUM CHEMICALS DIVISION
NEWS

September ★ *One of a Series of Interest to the Petroleum Industry* ★ *1951*

New Houston Office for Gulf Coast District

The Gulf Coast District Office of the Du Pont Petroleum Chemicals Division will soon move into its new Houston headquarters. The new offices are located in the recently completed National Bank of Commerce Building. They are considerably larger than those formerly occupied by the Division's Houston staff and pleasant surroundings have been created by one of Houston's leading decorators.

Superintendent of TEL Manufacturing Area

H. CLIFFORD BAILEY is superintendent of the Tetraethyl Lead Area of the Du Pont Chambers Works at Deepwater, N. J. He joined the Company in 1924 after graduating from M.I.T. and started his Du Pont career as a chemist in the Jackson Laboratory.

H. CLIFFORD BAILEY

In 1925 he was transferred to the Chambers Works. Here he held three jobs successively as a supervisor of the Phenylglycine operation, the Indigo Area and in the Tetraethyl Lead Area. In 1937 he was transferred to the Baton Rouge, La. plant as assistant manager.

After a period in military service he returned to Du Pont and was made technical assistant, Petroleum Chemicals Division, at the Wilmington office. In 1950 he was transferred to the Chambers Works to his present job of superintendent in charge of TEL manufacture.

New Du Pont Color Movie Dramatically Depicts Safe Gasoline Transport by Tank Truck

Film Available to Petroleum Industry for Showings to Municipal Authorities, Safety Groups, Civic Organizations

WHAT do Mr. and Mrs. America think of your gasoline trucks? Judging from reports in publications, and various restrictive regulations, they have some false notions about the safety of these vehicles. Since tank trucks are indispensable, something has to be done to change their minds. But what?

"IS THAT GASOLINE TRUCK SAFE?" asks a finicky lady motorist of our tank truck driver. In the new Du Pont movie, his clear explanation of the facts convinces her that the truck *is* safe.

To help the petroleum industry overcome this prejudice, Du Pont has produced a full-color sound movie on tank truck safety. This film is available to oil companies. It is a Hollywood-produced picture entitled "Pipeline on Wheels." The film is specially designed to give the public the facts about the safety features found in tank trucks built today.

Realistic acting and careful script writing point up the story. Forcefully and memorably the new film presents a winning case for the tank truck. Its message is in the form of an entertaining human-interest story. The chief characters, played by Hollywood actors, appear as typical, motoring-conscious Americans.

Throughout the picture, four main points are stressed: (1) The importance of the gasoline tank truck in our modern motorized civilization. (2) The fact that tank trucks are engineered and constructed for great strength and safety. (3) Evidence that tank trucks protect and retain their cargo even when rolled over or exposed to fire. (4) That size is no evil in tank trucks because large loads mean fewer trucks on the highway and, consequently, fewer exposures to traffic hazards.

Besides filling a definite need in public education, the film is ideal for training use. It can be employed effectively to develop job pride among tank truck drivers and maintenance men. Step by step, it shows how the modern tank truck is built to strict specifications for maximum safety. In two spectacular

SPECIAL
In this issue . . .
see back page for progress story on Du Pont's new TEL manufacturing facilities.

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DU PONT

PETROLEUM CHEMICALS DIVISION
NEWS

DU PONT

CONTINUED

New Movie

demonstrations with a full-size tank trailer loaded with actual gasoline, the movie proves conclusively that a gasoline truck can be rolled over without spilling and that it will not explode—even when subjected to severe fire beneath it.

In preparing the script, Du Pont consulted representatives of the Board of Fire Underwriters, the National Safety Council, the National Fire Protection Association, the API and NPA, as well as many automotive engineers and oil company personnel—over 100 people in all. These men cooperated enthusiastically and many offered sound suggestions which were incorporated in the film. As a result, "Pipeline on Wheels" is as authoritative as it is possible to make it.

THE SAFE CONSTRUCTION of a gasoline tank truck is stressed in this driver training scene from "Pipeline on Wheels."

Prints of the film are available to oil companies for use as they see fit and may be borrowed or purchased through any Du Pont Petroleum Chemicals Division District Office. The showing time is 26 minutes.

"Pipeline on Wheels" provides a feature attraction around which can be planned meetings with civic organizations, public officials, fire or police departments and other interested groups. And it provides a valuable supplement to training programs for tank truck drivers and oil industry personnel in general.

THIS "TAKE-HOME" BOOKLET, describing the movie in detail, is available to oil companies for distribution in connection with showings of "Pipeline on Wheels."

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AS THE STEEL WORK of Du Pont's new TEL plant nears completion, the job foreman checks construction details.

LITERATURE AVAILABLE

The Petroleum Chemicals Division of Du Pont has published a wide variety of material of interest to the petroleum industry. This includes technical papers, bulletins, reports and memoranda as well as equipment operation bulletins, safety regulations, tank cleaning data, marketing aids and the like.

Any of this is available on request to your nearest Du Pont Petroleum Chemicals Division District Office. A partial listing of available material is shown below:

Possible Mechanisms By Which Combustion Chamber Deposits Accumulate and Influence Knock . . . . . Serial A-2087a

Tank Talk—a 52-page booklet which outlines safe procedure for cleaning gasoline storage tanks. Written for the man who does the cleaning . . . . . Serial A-1134

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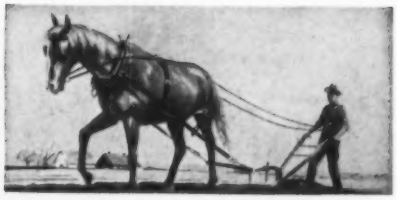

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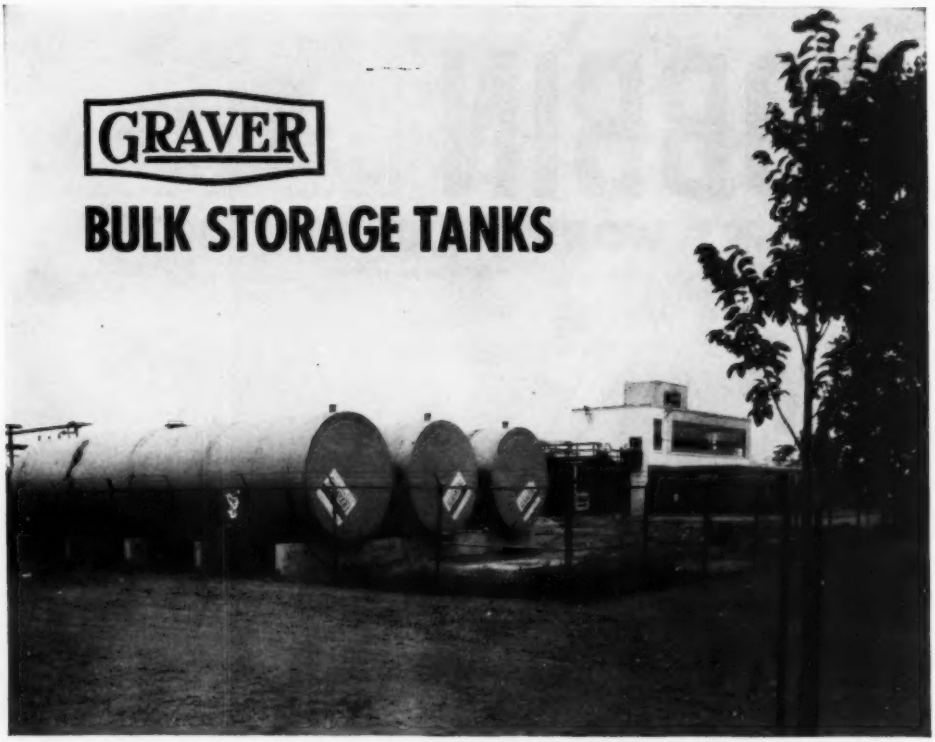

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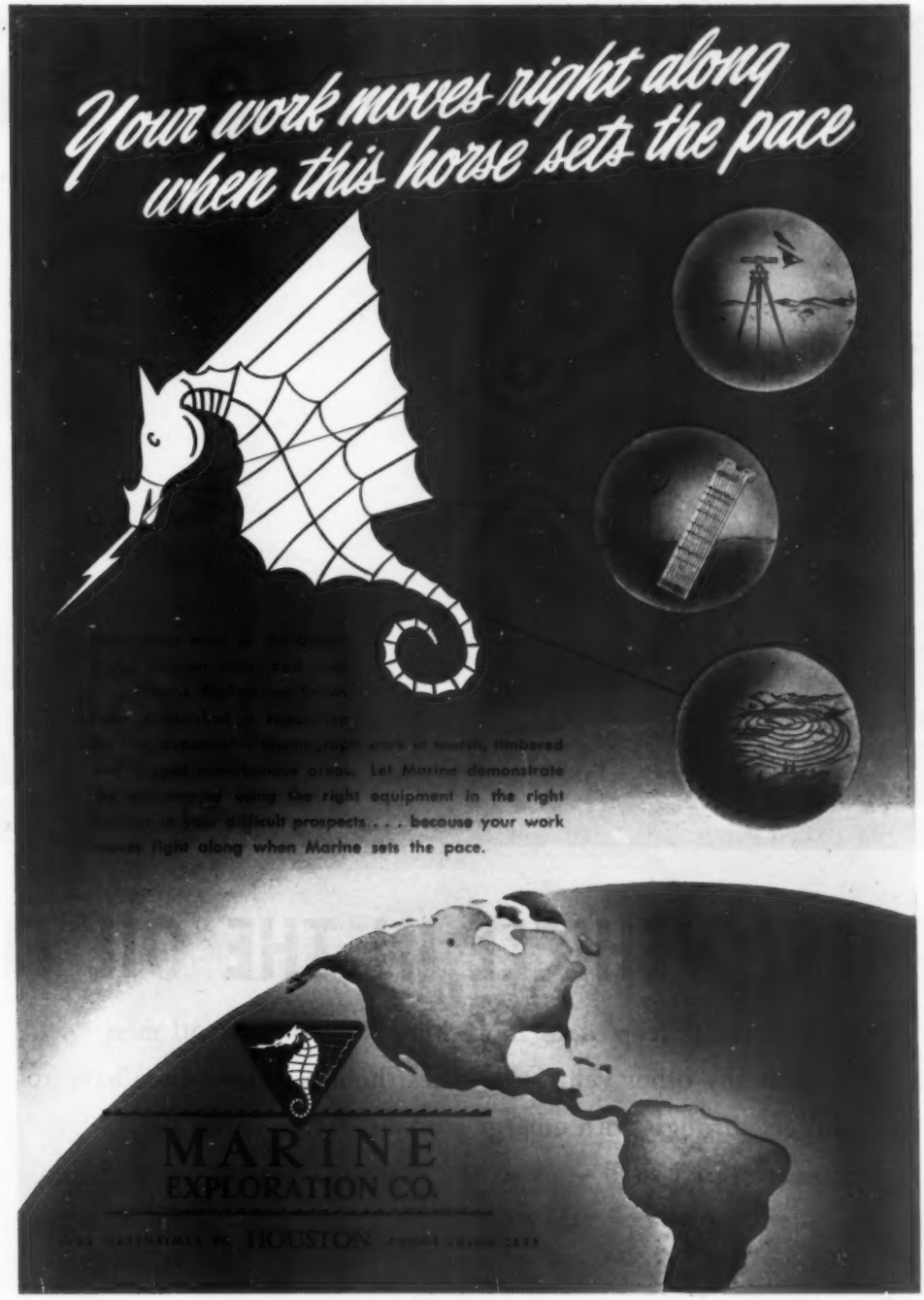
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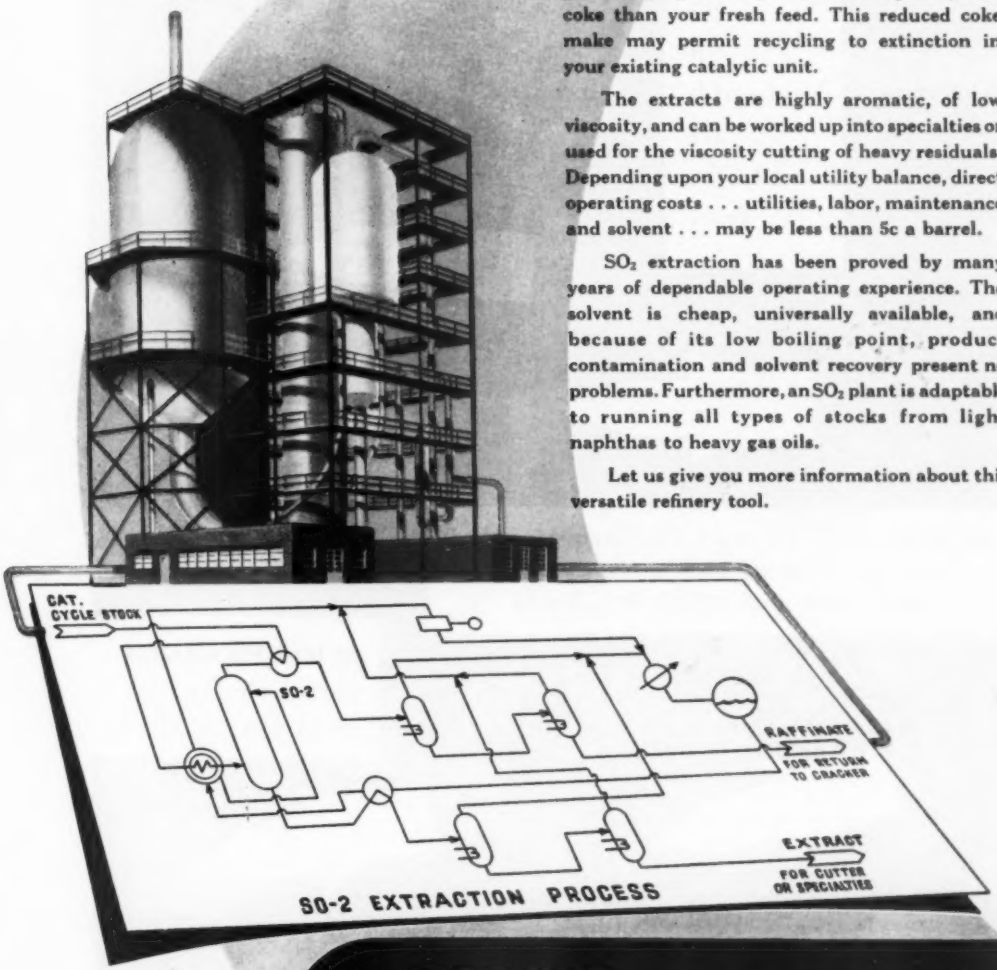

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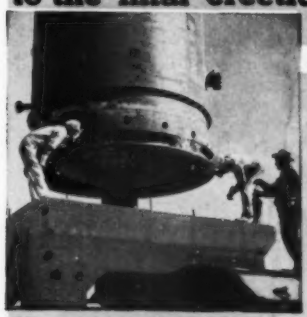

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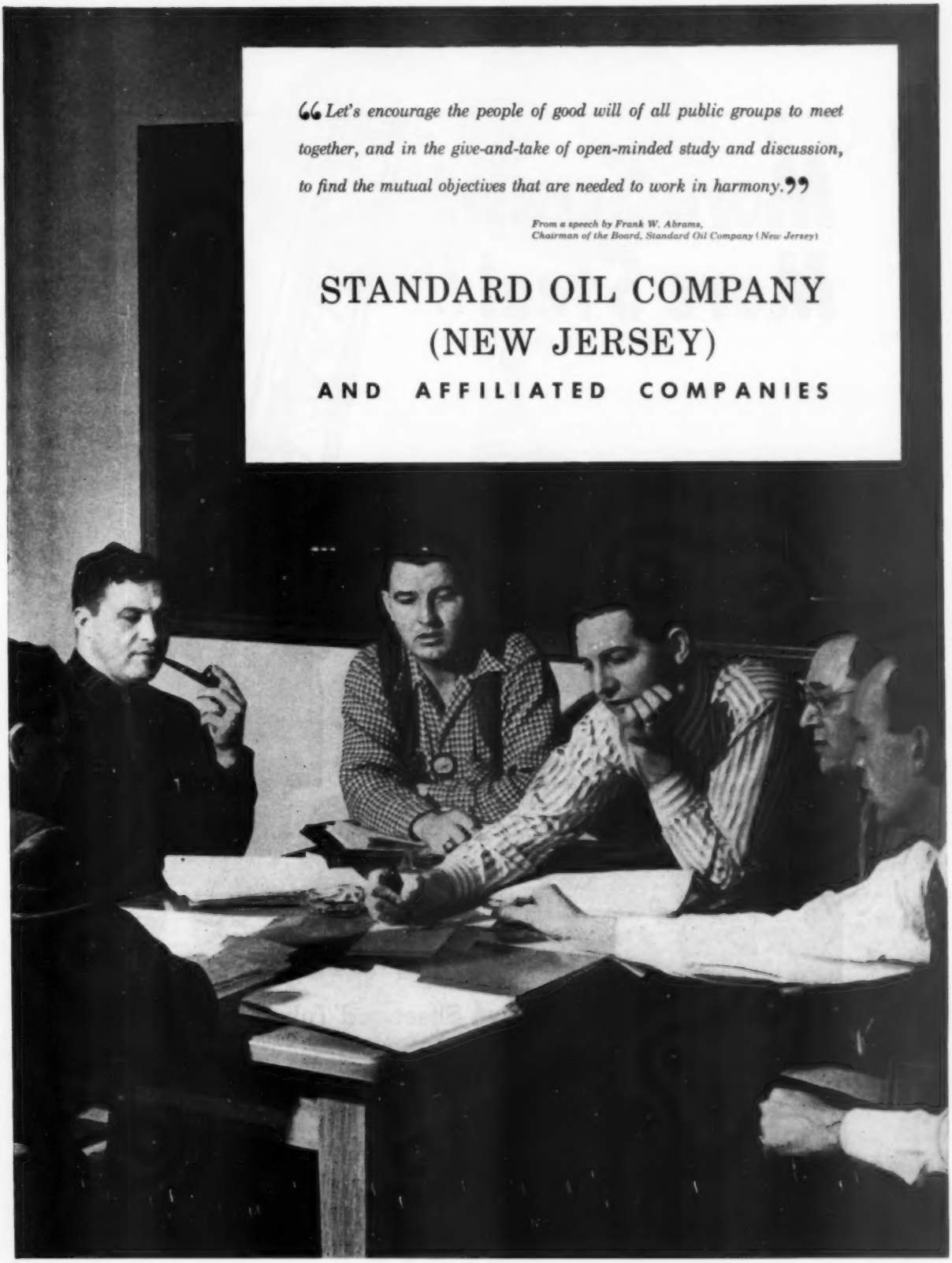

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Oil As a Global Industry

Almost from its inception as a commercial product, oil has been an international industry in which significant developments in one part of the world were reflected to some extent in all other parts. Yet for many years, and in fact up to the close of World War II, the industry was largely dominated by the United States which produced roundly two-thirds of the entire petroleum supply and shipped its products to markets in every quarter of the globe. Prices everywhere were based on United States Gulf Coast quotations.

Since the close of the late war, however, a change of almost revolutionary dimensions has taken place. To meet a worldwide upswing in demand, production has expanded tremendously. In the United States it has risen 31 percent. In the same period the crude output in other countries, excluding those behind the Iron Curtain, has increased 160 percent. As a consequence, in mid-1951, the share of the United States stands at 51.6 percent with these other countries producing 40.6 percent and the Soviet area accounting for the remainder. Of the 4,872,000 barrels of current daily production from these countries, 2,223,100 barrels are supplied by the Western Hemisphere, with Venezuela the chief factor; and 2,549,000 barrels by the Eastern Hemisphere, with the Middle East the main contributor.

Definite evidence that the oil industry was moving to a new high level of activity began to appear directly after the close of hostilities at the end of 1945. In line with the rapid expansion of industry in general, American consumption of petroleum has risen at the astonishing rate of 300,000 barrels daily in the ensuing six years. In the war-torn countries of the Eastern Hemisphere oil became a fundamental factor in restoring shattered economies to a sound basis. In Europe particularly, dependence on liquid rather than solid fuel was stimulated by the shortage of coal. In the three years since 1948 the movement to make more oil available to European countries on terms which they could meet has been encouraged by the policy of ECA in aiding the enlargement of their refining facilities and extending limited assistance to the development of production. The doubling of Europe's refining capacity prepared the way for the next step toward a more balanced global entity for the oil industry which took place when the United States became a net importer of petroleum, greatly reducing its volume of shipments to the outside world though still retaining a substantial export trade in products.

As it stands today the United States still consumes nearly 60 percent of the total petroleum output while producing something less than 52 percent. Consumption in the United States has risen 47.6 percent since 1945 while in Europe the increase has been more than 50 percent and in many other countries the gain has been very much higher percentagewise. Whether the relative growth will be maintained in the near future will depend upon a number of factors, including the ability of all countries to continue their current pace of industrial advancement and whether the world will be fortunate enough to escape another devastating conflict. In a report issued a few weeks ago by a committee of the National Petroleum Council of the United States, it was estimated that by 1955 the demand for oil in countries other than the United States and the Soviet Union would reach 5,500,000 barrels per day. This is based on the rate of increase of the past few years and anticipates a rise of 2,000,000 barrels daily over 1950. It seems a conservative forecast based upon the continuance of present conditions. Although the report did not attempt to forecast the extent of demand in the United States by 1955, conservative estimators anticipate a probable gain of 25 per cent.

At the same time the committee takes an optimistic view of the world's ability to satisfy the rising demand. It points out that while the areas outside the United States and the Iron Curtain countries had a deficit of 320,000 barrels daily in 1938, this had been reduced to 244,000 barrels in 1950. Since that time the margin has been narrowed greatly and should disappear by the end of the current year. The committee calculates that by 1955 production from these areas will be between 6,092,000 and 7,139,000 barrels per day, providing a surplus of 500,000 to 1,300,000 barrels above their own requirements. If the United States can enlarge its own production to cover the growth in domestic demand during this period, the rise in output in other areas would permit it to draw imports at the 1950 rate under the lower estimate while the higher forecast would make available imports of nearly a million barrels daily.

This outline of possible developments does not mean of course that oil trade will become compartmentalized. Rather it indicates that the industry is becoming more fully integrated on a global basis. Oil will continue to move overseas from east to west and west to east according to variations in conditions of production and demand. It is a guaranty of stability that large scale production has developed in widely separated areas.

The events which have thrust the United States into the forefront of world affairs have given it an interest greater than ever before in the preservation of free enterprise in the petroleum industry, since it is true more than ever in past history that oil is the fundamental factor in industrial progress and the surest guaranty of security against armed aggression. It is a source of satisfaction, therefore, that the industry is so broadly based and in position to serve humanity as an effective and well balanced industrial entity.

World oil consumption in 1951 is expected to exceed last year by 11 percent. Under stimulus of military preparedness world demand is rising about 450 million barrels yearly.

Demand to Top 4.4 Million Barrels

WORLD consumption of petroleum and products in 1951 probably will approximate 4,440,000,000 barrels, an average of nearly 12,200,000 barrels daily. Increase will be on the order of 11 percent over 1950 when world demand was about four billion barrels or 10,983,000 barrels daily of which 4,428,000 b/d was crude and the remainder natural gas liquids and synthetics.

If the current estimate of an 11 percent increase proves to be correct it will be slightly below the 1950 increase. Last year's demand was about 450,000,000 barrels or 12.6 percent greater than in 1949. First quarter reports indicate a considerably higher rate of increase than 11 percent but sales executives and economists are inclined to take a more conservative view of last half prospects. One reason for this, of course, is because the greater part of 1950 business was transacted in the late months of the year.

Eastern hemisphere sales of petroleum and products outside of Soviet Russia and satellite countries have been expanding at a more rapid rate than sales in the western half of the world. Communist countries have experienced the smallest rate of growth of any major segment of the globe. In 1950 Russia and Russian dominated countries consumed about 334 million barrels of oil and products, 915,000 barrels daily, compared with 305 million barrels (837,000 b/d) in 1949. The increase was 9.3 percent compared with 15.4 percent elsewhere in the eastern hemisphere and 12 percent in the western hemisphere. Little or no information is currently available regarding the 1951 trend of demand in Russian dominated countries. Official announcements usually are delayed and not definitely informative.

Outside of Communist territory the eastern hemisphere consumed about 857 million barrels of oil products in 1950 (2,349,000 b/d) compared with 745 million according to a recent report to the National Petroleum Council. The report was prepared by a subcommittee of the NPC Committee on Oil and Gas Availability, headed by John R. Suman of Standard Oil Co. (N.J.).

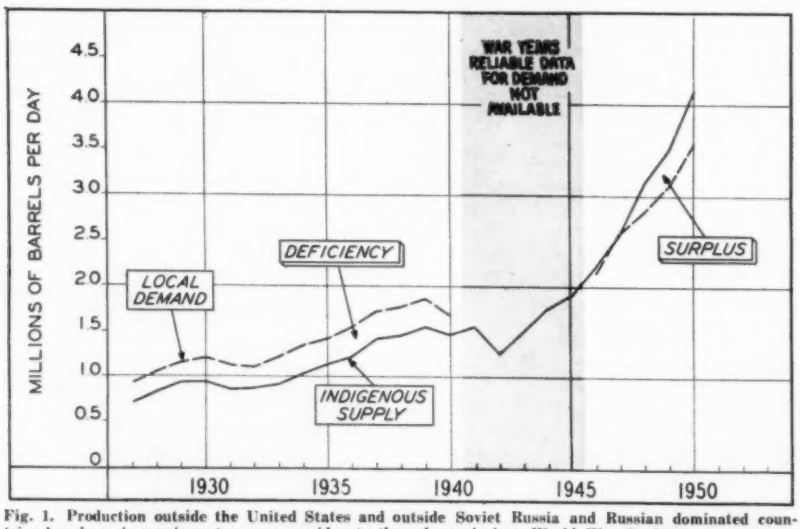


Fig. 1. Production outside the United States and outside Soviet Russia and Russian dominated countries has been increasing at a more rapid rate than demand since World War II despite a consumption rise at an annual compound rate of 13.3 percent. This chart was presented as a part of the recent report of the National Petroleum Council committee on oil and gas availability.

The committee pointed out that the world outside the United States consumed more oil than it produced before World War II. Important developments in production during the war permitted the United States to eliminate its net exports by the time the conflict was over. Since that time the United States has become a net importer.

Foreign production has met local demand for oil since the war despite the very rapid increase in consumption. The NPC subcommittee places the post war growth of foreign oil demand at the annual compound rate of 13.3 percent compared with 5.8 percent before the war. Figure 1 illustrates the change in the supply-demand ratio.

Eliminating the United States and Russian dominated areas, the world shortage of oil in 1938 was 320,000 b/d. The western hemisphere had a surplus of 371,000 b/d and the eastern hemisphere a shortage of 691,000 b/d. By 1947 the eastern hemisphere still needed 691,000 b/d from the west but the west had developed an exportable surplus of 673,000 b/d so that the United States needed to supply a net volume of 18,000 b/d.

In 1950 the eastern hemisphere had reduced its deficit to 244,000 b/d and the western hemisphere had developed a surplus of 819,000 b/d permitting the United States to import a net volume of 575,000 b/d.

This trend has continued during the first half of 1951. In the second quarter, for example, the eastern hemisphere (excluding Russian dominated areas) produced 2.5 million barrels daily of petroleum and products compared with an estimated demand of about 2.6 million barrels daily. The deficit of the eastern hemisphere thus was reduced to something like 100,000 b/d. Before the close of the present year the eastern hemisphere should be able to take care of its own re-

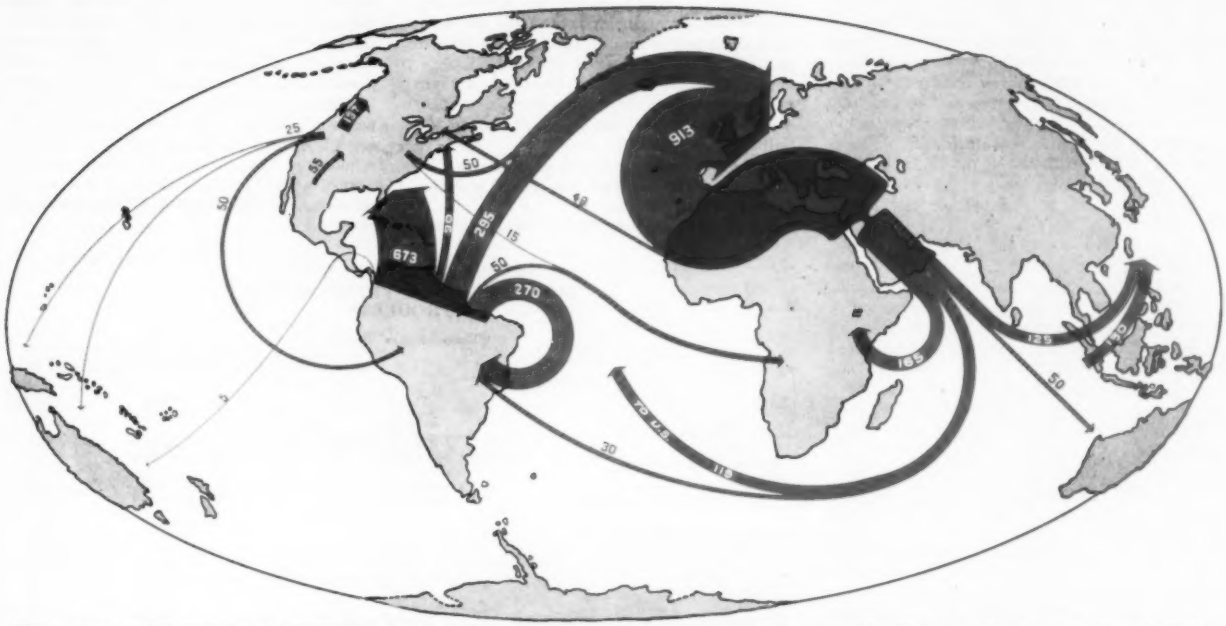


Fig. 2. Chart indicating principal intercontinental movements of petroleum and products in 1950. As compared with the previous year the flow of oil from the Caribbean to the United States was greatly expanded as was the flow of Middle East Oil to Europe. Figures on the chart are in thousands of barrels daily. Arrows in chart are not intended to indicate route followed, only origin and destination continents.

quirements for oil and products for the first time in history.

The self-sufficiency on the part of the eastern hemisphere does not mean, of course, that the interhemisphere flow of oil will cease as long as the world is not involved in a major war. In a peacetime economy there is certain to be a great deal of cross-hauling. Although the eastern hemisphere's net oil deficit in 1950 was only 244,000 b/d the actual flow of oil from west to east was in excess of 450,000 b/d. At the same time roundly 200,000 b/d of Middle East oil was flowing to refineries in the western hemisphere. The complexity of international trade in oil is suggested to some extent in Fig. 2 which traces some of the major movements. The chart is greatly simplified when compared with actual trading and is designed only to indicate the magnitude and direction of principal shipping.

A similar intercontinental flow chart published in the September, 1950, number of WORLD PETROLEUM indicated a movement of oil from west to east totaling about 490,000 b/d and an east-west counterflow of about 177,000 b/d. Net movement from the western hemisphere to the east declined about 50 percent in the one year.

Assuming that the rate of increase in demand for oil outside Russia and the United States continues unchanged in the next few years the total by 1955 will be about 5.5 million barrels daily, an increase of more than two million barrels daily over 1950.

The NPC subcommittee on foreign operations concluded as a result of its study that there was an excess productive capacity outside of the U.S.S.R. and the U.S. totaling 205,000 b/d as of January 1, 1951. At that time production totaled 4,498,000 b/d including 52,000 b/d of natural gas liquids, making productive capacity 4,703,000 b/d. The first half of the year has added greatly to this capacity as may be witnessed by the fact that second quarter production averaged 4,885,000 b/d and was still higher at the beginning of the third quarter.

An optimistic view of the ability of foreign areas to increase their producing capacity is held by the NPC subcommittee. This view is taken on the assumption that world economic activity will continue at a high level, that steel and manpower will be available and that adequate profit incentives will prevail. The subcommittee estimates that productive capacity in foreign areas will rise at an annual compound rate of from 5.4 to 9.1 percent in the 1951-55 period. At the lower rate capacity to produce would rise 289,759 b/d annually and at the higher rate 527,750 b/d annually. Details by years are shown in the following tabulation:

Productive Capacity of Petroleum Liquids

(Foreign excl. Russian Dominated Areas)

Year	Thousands of barrels daily Lower Range	Upper Range
1951	4,933	5,028
1952	5,346	5,703
1953	5,827	6,444
1954	5,979	6,796
1955	6,092	7,139

As previously mentioned demand for oil in 1955 in the foreign areas will approximate 5,500,000 b/d if the current rate of increase continues. The surplus productive capacity above this consuming level will be 592,000 to 1,639,000 b/d in 1955 on the basis of the NPC subcommittee estimates shown above. At the lower range excess productive capacity would be approximately equal to United States imports in 1950. In that year United States oil demand was 590,700 b/d in excess of domestic supply. If the lower rate is maintained it will be necessary for the United States to keep pace in output with growing demand. At the higher rate the United States would be able to draw in an additional million barrels of oil daily from other countries.

In the years between 1947 and 1950 domestic consumption of oil products in the United States increased 19 percent. At the same time foreign consumption outside the Russian zone was increasing 38 percent.

There are a number of outstanding examples of nations which are largely increasing their use of petroleum in both western and eastern hemispheres. Brazil has increased its demand 80 percent in three years, from 56,300 b/d in 1947 to 91,500 b/d in 1950. In Venezuela domestic demand was only 22,000 b/d in 1945 but by 1950 consumption had risen to 60,000 b/d. Since the close of the war gasoline sales were up 220 percent, kerosine 190 percent, fuel oil 110 percent and diesel fuel 140 percent.

Somewhat less spectacular increases have been achieved in other oil producing countries in Latin America, notably Argentina, Colombia and Peru. In the Caribbean, Cuba increased its imports of oil from 12.2 to 14.1 million barrels in 1950 as compared with 1949, an increase of 15.3 percent in a single year.

On the North American continent both Canada and Mexico are increasing their oil demand rapidly. Canada has raised its demand 36 percent since 1947. Demand in 1950 was double that of ten years ago. The far greater activity of Mexico's oil industry in the past two or three years is helping develop the economy of the nation and its consuming capabilities.

In the eastern hemisphere some of the most notable increases in demand for petroleum products have taken place in the countries which were hardest hit by the war. Consumption in western Germany is an outstanding

example. In 1948 consumption was about 14.2 million barrels or 39,000 b/d. Last year demand had risen 82 percent to 25.9 million barrels or about 70,500 b/d. Current estimates are that 1951 consumption will be on the order of 37.7 million barrels or 103,000 b/d. France has increased its consumption 40 percent in the past two years to 72.7 million barrels, 199,000 b/d, and it now is estimated that 1951 consumption will increase an additional 11 percent to 86.8 million barrels or 223,000 b/d.

Most of the remaining continental European nations increased their oil demand by 29-31 percent between 1948 and 1950. This year's consumption is rising at the rate of 11 to 19 percent over 1950. In the United Kingdom the austerity program and shortage of exchange has tended to limit increases in consumption. The lifting of gasoline rationing, however, caused British demand to rise 10.4 percent in 1950 to 15,276,771 long tons, about 335,000 b/d.

Consumption in Soviet Russia has been rising somewhat faster than production in that country. Farm mechanization and military requirements have been largely responsible although road transport also has grown as may be gleaned from reports of motor vehicle production. Russia has supplemented its domestic production by importing substantial quantities of oil as war reparations from satellite countries, notably Romania, Austria and Hungary. In these countries domestic consumption is rigorously limited in order to provide enough oil to meet Russian demands.

Africa has had an increase of 50 percent in oil demand since 1948 when consumption totaled about 65 million barrels, 180,000 b/d. Consumption in 1950 was about 100 million barrels, 276,000 b/d. More than half of the oil consumption in Africa is centered in Egypt and British South Africa. Egyptian consumption has risen less than 10 percent since 1948 from 26.6 million barrels that year to 28.9 million barrels in 1950. South Africa has increased demand 30 percent to 21.6 million barrels last year and 1951 demand is estimated at 23.7 million barrels.

Oil producing countries of the Middle East are expanding their local demand at a substantial rate. Despite the adverse comment regarding economic conditions in Iran, consumption there nearly doubled in the past two years, jumping from 11.2 million to 21 million barrels between 1948 and 1950.

In southern Asia Pakistan has had the largest percentage increase in consumption, rising 84 percent in two years from 3.7 million barrels in 1948 to 6.8 million barrels. Ceylon consumed 6.1 million barrels of oil in 1950 compared with 3.9 million barrels in 1948, an increase of 56 percent. The increase in India in the two-year period was only 15 percent from 21.4 million barrels in 1948 to 24.6 million barrels.

Average increase in demand in Oceania has been on the order of 30 percent since 1948. An exception is Indonesia where political disturbances have been subsiding and trade becoming more normal. Result is that 1950 demand was more than double 1948 rising from 5.4 to 14.2 million barrels. Australian demand was up 36 percent in two years and New Zealand 27 percent.

Conditions are somewhat mixed in the Far East. It is not possible to determine consumption in China since the Communist regime took over. Inshipments from the west have disappeared and Hong Kong no longer is a supply port. Result is that Hong Kong's apparent demand dropped from 8.1 million barrels in 1949 to 4.6 million barrels in 1950 and it is estimated that this will fall to 3.9 million barrels in 1951.

Japan has had an increase of 35 percent in consumption in the past two years and the Philippines 29 percent.

Direct military demand and industrial demand based on military preparedness activities has been responsible for a great deal of the increase in oil trade since the Korean war began. It is suggested that perhaps seven percent of all oil consumed in the world today is consumed directly by the military. If a peaceful attitude among nations could be reestablished the petroleum industry would be relieved of today's severe pressure and the normal annual increase of about 4-5 percent in demand might replace today's hectic 11 percent.

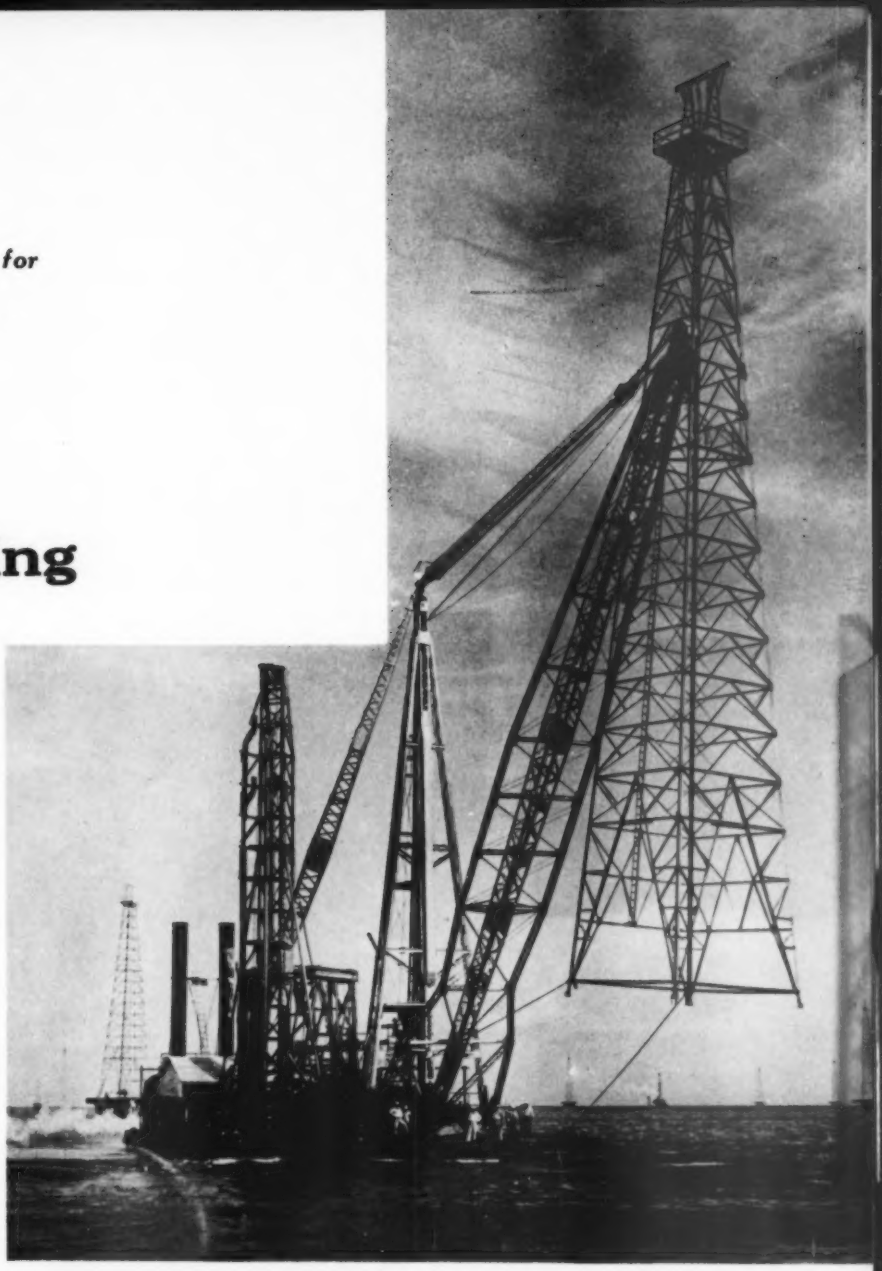
1950-51 ESTIMATED WORLD CONSUMPTION OF PETROLEUM AND PRODUCTS

(Thousands of Barrels)

Country	1950 Total	1950 Daily Average	1951 Total	1951 Daily Average
North America				
Canada	130,305	357	142,350	390
United States	2,372,135	6,499	2,619,970	7,178
Mexico	62,050	170	66,430	182
TOTAL NORTH AMERICA	**2,564,490**	**7,026**	**2,828,750**	**7,750**
So. America & Caribbean				
Argentina	56,590	156	63,875	175
Brazil	33,215	91	39,420	108
Venezuela	21,900	60	24,820	68
Cuba	14,235	39	15,330	42
Colombia	9,125	25	10,220	28
Peru	8,760	24	9,490	26
Chile	7,665	21	8,395	23
Uruguay	7,300	20	7,665	21
Others	94,155	257	112,785	309
TOTAL SO. AMERICA & CARIBBEAN	**252,945**	**693**	**292,000**	**800**
TOTAL WESTERN HEMISPHERE	**2,817,435**	**7,719**	**3,120,750**	**8,550**
Europe				
U.S.S.R. & Satellites	334,000	915	365,000	1,000
United Kingdom	121,940	334	132,500	363
France	72,700	199	80,800	223
Italy	31,200	85	34,100	93
W. Germany	25,860	71	37,800	104
Sweden	26,760	73	29,400	81
Holland	26,300	72	30,300	82
Belgium	16,920	46	20,000	55
Norway	10,750	29	10,800	29
Denmark	10,640	29	11,600	32
Spain	10,200	28	11,000	30
Greece	7,320	20	8,900	22
Portugal	4,330	12	6,600	18
Others	112,380	307	97,200	268
TOTAL EUROPE	**810,300**	**2,220**	**876,000**	**2,400**
Africa				
Egypt	28,904	79	33,366	91
So. Africa	21,580	59	23,732	65
Br. E. Africa	4,630	12	5,087	14
Others	45,626	126	50,965	140
TOTAL AFRICA	**100,740**	**276**	**113,150**	**310**
Middle East				
Iran	21,051	56	19,921	55
Aden	14,972	41	16,735	47
Saudi Arabia	7,130	19	5,168	14
Iraq	4,115	11	4,785	12
Bahrein	2,906	10	3,921	10
Others	43,266	118	55,320	152
TOTAL MIDDLE EAST	**93,440**	**256**	**105,850**	**290**
Far East & Oceania				
Australia	37,923	103	45,483	123
India	24,565	67	28,117	76
Japan	14 693	40	17,281	47
Indonesia	14,207	41	14,936	42
New Zealand	7,743	21	8,600	23
Philippines	9,749	27	10,747	29
Ceylon	6,020	17	6,603	18
Pakistan	6,791	18	8,572	23
Hong Kong	4,619	13	3,935	11
Others	60,570	165	67,426	182
TOTAL FAR EAST & OCEANIA	**186,880**	**512**	**211,700**	**580**
TOTAL EASTERN HEMISPHERE	**1,191,360**	**3,264**	**1,306,700**	**3,580**
WORLD TOTAL	**4,008,795**	**10,983**	**4,427,450**	**12,130**

The world-wide rise in demand for petroleum products is acting as a powerful stimulus to

Exploration and Drilling



Moving a drilling derrick to a new location on Lake Maracaibo, Venezuela. The 129-foot derrick weighs 12.5 tons. Moving it intact by barge saves four days. Creole Petroleum Corp. photo.

AT no previous time in the history of the oil industry has there been such widespread interest and activity in the development of hydrocarbon resources as exists at the present time. While the United States is still far in the lead in exploration and drilling as befits its position as at once the largest producing and consuming country, it is noteworthy that proportionately the growth in production and consumption has proceeded even more rapidly in other parts of the world. The American share in the world output which was 67 percent in 1945 is 52 percent in 1951. While production in the United States has risen 70 percent in this six year period that of other countries has more than doubled with an increase of 125 percent.

This represents the outworking of a movement that has long been anticipated as inevitable by oil industry economists. Several causes have contributed to its acceleration in the past few years. One factor has been transformation of the United States from a large exporter to a net importer of petroleum, a situation that is not likely to change in the near future. If Americans can continue to find the bulk of the oil needed to meet their growing domestic requirements, it will be a noteworthy achievement. From an estimated 25 percent of world reserves they have been supplying for forty years or more approximately two-thirds of the world's oil. With a constant and rapid enlargement of demand in all quarters of the globe it was to be expected that a point would be reached where more and more of the total supply would have to be found and processed in other lands. That turning point now has been passed.

Contributing largely to the enhanced interest which has developed in a number of countries has been the changing industrial climate. Up until the end of World War II for example, coal was the basic power factor in Western Europe which, next to the United States, is the largest market for petroleum products. Since the end of the war the scarcity and high price of coal, and in some areas the virtual impossibility of obtaining it, has made it necessary to turn to petroleum as a source of industrial power. This has resulted in a rapid increase in the consumption of fuel oil which, in fact, is responsible for the greater part of the entire expansion in demand in Europe since the use of gasoline has been restricted by heavy taxation or by severe rationing in many areas. Wider use has brought a stronger appreciation of the advantages of liquid fuel for power generating purposes and a recognition that oil is a fundamental factor in all industrial progress. In the United States, of course, the shift has been under way for many years until oil and gas now provide more than half of all the nation's energy requirements, but in other parts of the world the movement is just getting well under way.

A practical consideration that is encouraging the search for indigenous or readily available oil supplies stems from existing unbalanced exchange conditions. With petroleum products more in demand, oil imports require the payment of sums that may strain the economy of some purchasers who are led to look to the production or import of crude and to the construction of processing plants within their own borders. Thus they seek to accomplish a dual objective by lessening the financial drain and providing employment for their workers.

Western Europe itself is a case in point of the change in attitude that has taken place. Up to the end of the late war Europe was

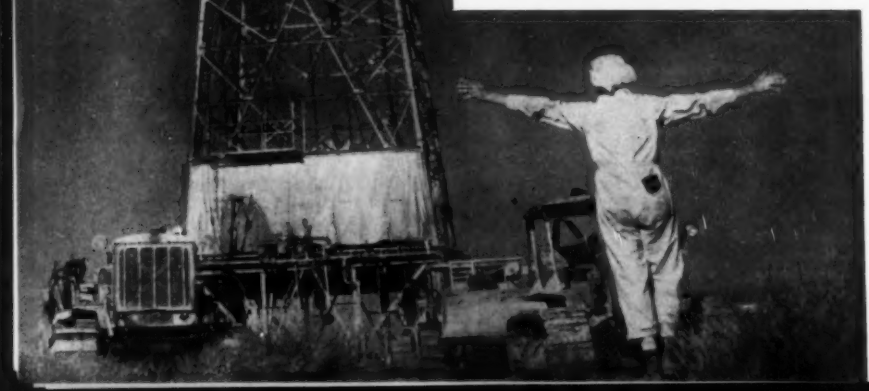
producing something over 500,000 barrels of oil daily but 95 percent of this was from countries that are now behind the Iron Curtain. Elsewhere on that continent, with the single exception of Germany, the possibilities of finding oil were considered hardly sufficient to justify the expenditure involved in surveys and testing. Within the past two or three years, however, and especially since inauguration of the Marshall plan which provided tools and equipment for a number of the undertakings, preliminary work has been carried on in half a dozen countries and production of crude has more than trebled.

In the western part of Germany where air attacks had badly damaged oil installations the restoration and expansion of the oil industry has made rapid progress since 1948. In that time production has been doubled, a number of new fields have been discovered and drilling has reached a new high. In the early months of 1951 more than a hundred rotary rigs were in operation in addition to light rigs and portable outfits used in survey operations and geologic tests. Exploration is being extended to new areas and a project is under consideration for offshore drilling in the North Sea.

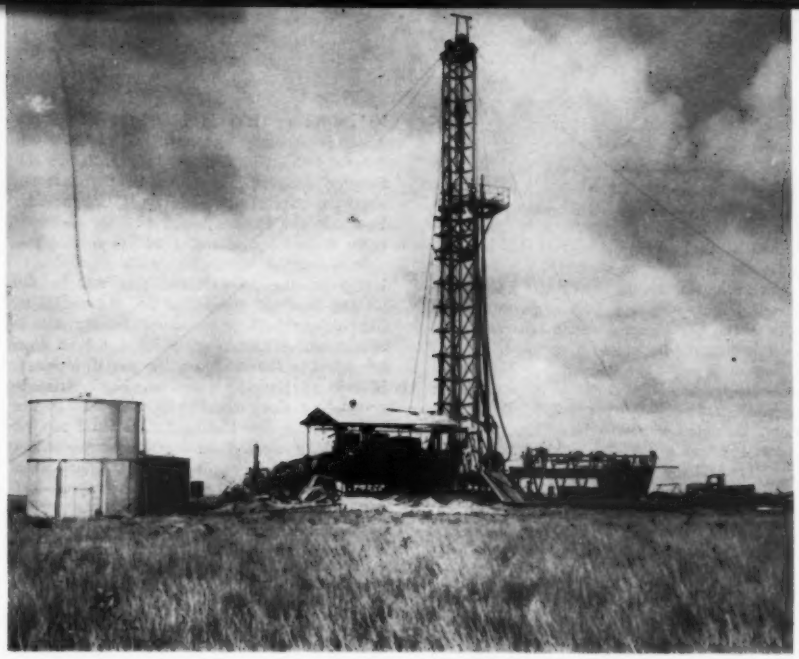
Discovery of gas in the St. Marcet district of France just before the start of the war aroused interest in further investigation but little could be done during the occupation and the depressed period that followed. Early in 1950 an oil producer, the first in that part of France, was put into operation at Lacq, in the foothills of the Pyrenees, near Pau. This initial well has been followed by seven others which are yielding oil at the rate of more than a million and a half barrels per year. Five heavy rigs and one portable are now engaged in further drilling to determine the extent of the field. The Lacq field is being developed by the Societe National des Petroles d'Aquitaine, a corporation under joint ownership of the French government and private interests. The success of its efforts has led to the granting of additional concessions, one to the eastward held by the Societe Nationale des Petroles Languedoc Meditereen, a French company, and another to Standard Francaise des Petroles, to the northwest. In the former a geophysical survey is being conducted and exploratory work on the latter is to begin shortly. Elsewhere in France some additional production has been gained in the old Merkwiller district near the eastern border and plans are being prepared for exploratory work in other areas. Some thirty geophysical crews are now operating and $150,000,000 is marked for exploration in 1951-52.

Italy is another country in which activity has been stepped up greatly in the past few years. The most important tangible result to date has been the extensive gas development in the Po Valley and the building of pipe lines to convey gas to the industrial cities of northern Italy. Geologists have confidence however, that substantial petroleum deposits exist in this and other areas. International oil companies have indicated their interest in undertaking exploration but have been deterred by certain provisions of Italy's mining law. A

▲ Delivering 31-32-inch pipe for the new Iraq pipe line now under construction. Photo by A. R. Tanner for Iraq Petroleum Co.



Skidding a rig in the Burgan field, Kuwait. Photo courtesy Kuwait Oil Co., Ltd. ◀



Portable drilling rig in the Temblador field, Venezuela. Creole Petroleum Corp. photo.

revision of that law has now been approved by government authorities and it is expected that it will be put into effect before the end of the year. While reserving operations in the Po Valley to the government's own company it establishes more favorable conditions for private companies in other areas. Increased exploratory activity in central and southern Italy is expected to result.

Gulf interests have completed airborne magnetometer and mapping work in Sicily and now are engaged in geological reconnaissance and gravity survey. Additional concessions are being negotiated. Macmillan Petroleum Corp. for several years has held a concession in Sicily and other international companies are considering plans for undertaking operations when the new regulations go into effect. A doubling of exploratory and drilling operations is anticipated in 1952.

Among the small European countries The Netherlands, encouraged by the success of its Schoonebeck field near the German border which is now producing some 25 percent of national requirements, is now engaged in a systematic survey of other districts and of offshore possibilities. Danish American Prospecting Co. (Gulf) is continuing its exploratory drilling campaign in Denmark with two rigs. A heavy rig suitable for deep testing is drilling currently at about 5,600 feet at Tonder-by. The previous wildcat at Hividsten in northeast Jutland was abandoned as dry in the lowermost Triassic at 11,359 feet. The company also is operating a light rig suitable for drilling to 5-6,000 feet, which has completed a number of dry holes during the past year on shallow domes.

Danish-American began its operations in 1938 and has continued the exploratory work continuously since that time except during the war. The company obtained a new 50-year concession last year covering 17,000 square miles including off-shore areas. It covers salt and other minerals as well as oil. A 10-year exploratory period is provided in the concession. Other European countries in which active exploration is now under way include Sweden, Spain, Yugoslavia and Turkey. It is not to be expected that these countries, singly or as a whole, will rival the world's great centers of oil production, but the energy and extent of their exploration and drilling indicates the importance that is attached to the finding of petroleum in large or small volume.

Across the Mediterranean from Europe lies the great continent of Africa which was written off by most geologists years ago as offering little encouragement to oil prospectors except for a few fringe areas such as Egypt which has possessed a small oil industry for many years. Yet this dark continent is now the object of plans for exploratory operations covering widely separated areas. Following the location of new producing structures in Morocco and Algeria in 1950, more than 17 million acres of concessions have been granted for oil exploration work in Tunisia to three companies and an active campaign is being pressed by all three. The government controlled SEREPT is the largest holder with more than ten million acres plus its joint concessions with others. Gulf is the major participant in Soc. Nord Africaine and Shell holds the principal interest in Cie. de Petroles de Tunise. The Gulf concession covers nearly five million acres and now is being studied by reflection seismograph and geological reconnaissance parties. Similar work is being carried on by the Shell group. All operators have found aerial mapping to be helpful in speeding their reconnaissance. SEREPT has been trying to find oil down dip from the wet gas found in the Cap Bon structure but thus far without success. Gulf and Shell probably will advance to the drilling stage this year.

Mozambique Gulf Oil Company recently conducted an aerial magnetometric survey of its 47,000 square mile concession in Portuguese East Africa, and ground work is now being carried on by seismograph and gravity crews, a core and electric log unit and geological reconnaissance party. Other areas for which surveys are projected are Angola, the Cameroons and the Belgian Congo. In Ethiopia Sinclair Petroleum Company, after sinking one dry hole, is conducting further surveys on the basis of the geological information obtained before drilling a further test.

After discouraging exploratory activities by the imposition of restrictive operating conditions and embargoing the export of oil, Egypt is again trying to enlist the interest of private companies. A limited amount of drilling in 1950 provided some new production and development is being continued on the Sinai peninsula. Altogether some 25 rotary rigs were drilling in Africa in the first quarter of 1951 and some 30 or more geophysical crews were engaged in surveys. Thus far, however, the search for oil in this vast area is only in its initial stages and must continue over many years.

Turning to more fully established sections of the oil world the development in production and likewise in exploration and drilling is remarkable, yet it is but the forerunner of intensified activity that may be expected to continue indefinitely under the rising pressure of demand. Between 1949 and 1951 the rise in production in the United States has been 22 percent but in other countries outside the Soviet orbit the gain has been nearly double or 39 percent. To maintain such a high rate of increase demands a very energetic campaign of drilling which in turn must be preceded by a broad program of exploration.

In the first quarter of 1951 the number of rotary rigs employed in these countries was approximately 950; wells drilling at the time numbered 685. Light rigs and portables used in geophysical work and test drilling totaled over 300 according to the best estimates obtainable. With the plans that have been adopted for the extension of exploratory work substantial additions to all drilling equipment will be required during the next year or two.

The greatest activity in exploratory and development work being carried on outside the United States is under way in Western Canada where a thousand wells were drilled during 1950 of which approximately two-thirds were producers. Crude output, held down by severe proration because of the lack of transportation facilities, added 7.5 million barrels or 35 percent to Canada's yield during the year. Some 180 new wells were drilling at the end of the first quarter of 1951 and more than 100 geophysical crews were prospecting new areas for development. The pace of future activity in Canada will be measured only by the rate at which the means of transportation can be provided to move its oil to waiting markets.

Mexico has been gradually increasing its oil output for several years and recently adopted an ambitious drilling program in the effort to supply its rapidly growing domestic consumption with a balance left over for export. Plans for the current year as announced by Senator Bermudez, executive head of Petroleos Mexicanos, provide for the drilling of a minimum of 300 wells during the current year, keeping 105 drilling rigs in operation and 44 geophysical crews engaged in survey work. Chief concern as to fulfillment of this program is the question whether sufficient supplies of steel will be available.

Both on its own account and through drilling contracts with foreign companies Petroleos Mexicanos has been active during the first half of 1950 in its efforts to build up reserves in Mexico. Production, meanwhile, was increased to more than 200,000 barrels daily.

Increased seismographic work is being done northeast of the new Jose Colomo field toward the Cima gas field of Xicalango. Interest in this zone has been increasing since about three months ago when a Petroleos Mexicanos crew brought in a 1,900-barrel-a-day test well in the Jose Colomo field near Mascupana, in the state of Tabasco. Pemex is currently drilling a second well in the region. The Mexican-American Independent Oil Co., which operated in Mexico as Cima, has spudded in its first exploratory well on the Tecominoacan structure of the Isthmus of Tehuantepec, it was announced in Mexico City by company officials.

The new well will be drilled to 8,250 feet. The location is about 55 miles east and inland from Rabon Grande, where Cima discovered a 225-barrel producer in June. Rabon Grande is on the coast close to Coatzacoalcos in the State of Veracruz. Tecominoacan is an area of "considerable promise" according to Ralph K. Davies, American Independent's president. He said seismic work has shown the existence of a large structure, stretching northward from the well site.

Elsewhere on the North American continent the principal drilling activity has been in Trinidad where 145 wells were drilled during the past year and where 26 rotary rigs are in operation. Interest in Trinidad is directed particularly to the possibilities offered by deeper drilling and by marine development offshore, especially in the Gulf of Paria.

Cuban Gulf Oil Co. is drilling an offshore wildcat in its Blanquizal concession, Las Villas province, recent depth being about 5,000 feet. The location is in nine feet of water about 11 miles from the mainland. A previous wildcat located some 50 miles west was abandoned because of unpromising structural conditions.

Other Gulf subsidiaries are carrying on active reconnaissance work in the Caribbean. Gulf has concessions in the Bahamas, Honduras and Barbados. Seismic study and geological studies are in progress on the 85-square-mile concession on Barbados. In other areas geological reconnaissance is being conducted. Other companies hold exploratory permits in the Caribbean-Atlantic area and have been conducting preliminary surveys.

Venezuela leads the way in South America as befits its dominant position as a producer with an output of over 1,700,000 barrels daily. Its quota of new wells in 1950 was just under 400 and about 100 rotary rigs are in operation. Three new fields were located but most of the activity was directed to the further development of areas already producing. No new concessions have been granted by the government for several years, but it has been reported that new awards will be made before the end of the year. In that event an increase in the tempo of drilling is expected as a number of companies not represented in Venezuela have been awaiting an opportunity to enter the country.

With a current oil consumption of about 100,000 barrels daily and a domestic oil production of only about 2,000 barrels, Brazil is becoming more active in the search for oil as well as in the construction of Brazilian refineries. During 1950 two gravity and five seismograph crews were in the field. This year an additional seismic party is busy.

As part of the wildcat testing the Conselho Nacional do Petroleo has drilled a 13,000-foot well in the Marajo Basin up the Amazon River from Belem. The well was dry at this depth but four or five upper zones are being tested above 8,700 feet at which point casing was set. In the same general area a 15,000-foot test is to be begun soon in the Maranhao basin south of the Amazon. This wildcat has been delayed a year due to difficulties in moving in equipment. A new Amazon test is to be drilled on Marajo island at a location which is normally under water. To the south the Conselho will drill at Japaratuba in the Sergipe Alagoas basin and in the extreme southern part of the country at Guarei, Sao Paulo, in the Parana basin. In 1950 the Conselho drilled 3 discoveries out of 6 wildcats

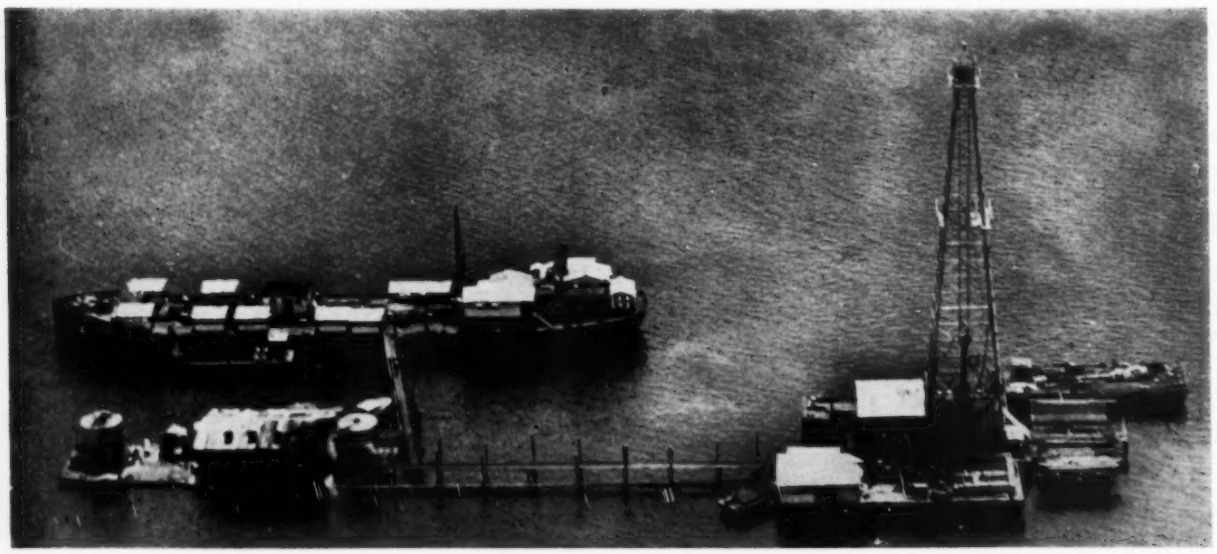
In Colombia, where 103 wells were drilled last year, the principal activity was in the Casabe field of Shell and in the north of Santandar where Colombian Petroleum Co. is operating. Wildcatting, which has been at a low point in Colombia for the past few years, is now experiencing a revival. Exploration is proceeding along the Caribbean coast in the north, along the Pacific littoral and in the upper Magdalena valley. One company has applied for a concession in the Llanos area which points to a probable renewal of test drilling in that region.

Manabi Exploration Co. recently was successful in a well drilled in El Tigre field in Ecuador. The well flowed 440 barrels of 40 gravity oil from the Atlanta sand at 2,135 feet. Manabi recently purchased Ecuador Oilfields Ltd. properties and will develop these as well as a number of large untested concessions in the coastal area.

Drilling activity in Peru increased last year with some 200 wells put down. Most of the drilling was done by International Petroleum Company in extending its established fields. Exploratory permits have been granted to Conorada and Richmond petroleum companies and geophysical surveys are under way. Enlarged drilling is expected to follow final confirmation of Peru's new petroleum law. Other South American countries which are taking steps to increase production are Argentina, Bolivia and Chile. An increase in the present number of about 250 active drilling units in So. America is expected in the coming year.

In the Middle East where production per well is much higher on the average than in the western world only a limited amount of drilling has been necessary in order to raise production in the more active areas by 14

Cuban Gulf Oil Co. exploratory test well drilling in nine feet of water 11 miles offshore from Playa Panchita, Province of Las Villas, Cuba. Photo courtesy Gulf Oil Corp.



percent over 1950. Some 40 large rigs were in operation there in the first quarter of this year. As is well known, difficulties between the Anglo-Iranian Oil Company and the Persian government have led to the suspension of all operations in Persia, temporarily at least. During the past year important developments have taken place in Iraq in preparation for the opening of new pipe lines which will permit the movement of a larger volume of oil. These have included drilling in the second section of the Kirkuk field and also in the southern district where the Basrah Petroleum Company will soon be moving its output to a new terminal on the Persian Gulf. Eighteen productive wells were completed during 1950 and further drilling will be carried on when the new outlets are in operation.

Kuwait production has been rising sharply in recent months as demand for crude has grown more active in the Persian Gulf. First half output was about 447,000 b/d, an increase of 44 percent over the first half of 1950. June output was up to 528,000 b/d and July even higher, preliminary estimates being about 650,000 b/d.

Drilling in Kuwait has been conducted on a steady basis. The deep wildcat still is active probing formations below the Cretaceous which is the producing horizon in the Burgan field. In addition two rigs normally are busy with fill-in drilling. No step-out wells have been sunk this year. At June 30 there were 112 wells in the field compared with 99 on Dec. 31, 1950. Cumulative production of the field at June 30 was 365 million barrels.

In addition to its routine drilling for the development of existing fields the Arabian American Oil Company has opened a new chapter in 1951 by completing its first offshore well in the Persian Gulf near Ras Safaniya and has projected further offshore tests which may add substantially to the oil resources of that area.

Pakistan and India are other Middle East countries in which exploration is being conducted with encouragement from their respective governments which are anxious to develop indigenous petroleum supplies. Settlement of differences between the Burmese government and the Burmah Oil Company has permitted the resumption of drilling in that country during the current year.

The Far East is an area of great activity at the present time in response to the growing demand for oil in that part of the world. Production in Indonesia now is higher than before the war although there are a number of areas still in which operations have not been resumed, notably in northern Sumatra and in Java. Central Sumatra has been less troubled by political unrest recently and development has been moving forward.

The Minas field in central Sumatra is scheduled to begin producing next year. Caltex Pacific Petroleum Co. is the operator. At Minas the company had moved in a rig and prepared to drill before operations were suspended because of the war. When the conflict was over it was discovered that the Japanese invaders had drilled a well and found production. Caltex has drilled 13 wells since the war and blocked out a substantial reserve. With a field force of some 800-900 including 700-800 Indonesians, Caltex has been developing a camp, building roads and preparing right-of-way for a pipe line outlet.

Papuans erecting a derrick for Australasian Petroleum Co. at Wana. Due to soft "mudstone" soil and excessive rains in this region the derrick was built on a timber matting foundation. Photo by Brian Chirlian for Standard-Vacuum Oil Co.

During the second quarter of 1952 a 20-mile, 12-inch line will be completed from the field to a river terminal on the Siak river. Shallow-draft river barges will carry the oil down stream to Brower Strait opposite Pulu Bengkalis for transfer to ocean-going vessels. Original plan had been to build a 100-mile line direct to tidewater but this has been postponed because of steel shortages and difficulties of laying a line in this area. After the field gets into production on a commercial basis and more of its potentialities are known Caltex probably will build a refinery at some point in the Far East, perhaps in the Philippines, to serve its growing markets in the region.

In southern Sumatra Shell and Standard-Vacuum are the principal operators. Both are active in development and exploratory drilling. Twins have been drilled for most of the wells which were destroyed under military direction during the war and most of the development drilling is of step-out or fill-in wells. About 23 rigs are active in southern Sumatra currently.

In Netherlands New Guinea Standard-Vacuum is building a road to the Waseon area and trying to evaluate this field. Klamono continues to be produced at about 4,800 b/d.

Wildcatting continues without productive results in the eastern portion of New Guinea. Australasian Petroleum Co. abandoned its Wana test in southern Papua at 9,866. Small showings of non-commercial importance were encountered. The Ornati well found the lime section unusually thick and was abandoned at 5,453 feet. Hohoro No. 2 was drilling recently at 2,770 with less "mudstone" difficulty than that which forced abandonment of the first test at this point.

New impetus has been given to the search for oil in Australia through efforts directed to the western part of that continent which heretofore has remained practically unexplored. Ampol Petroleum Ltd., an Australian

(Please turn to page 88)

World Oil Production Ample to Meet Current Demand

WORLD production of crude petroleum averaged 11,698,000 barrels daily in the first half of 1951, an increase of 1,269,500 barrels daily or 12.2 percent over the average for 1950. Adding 600,000 b/d of natural gas liquids the net new supply of hydrocarbon liquids was nearly 12.3 million barrels daily, generously supplying the rapidly growing world demand.

Average production of crude in June was well over twelve million barrels daily. The record of 12,119,300 b/d exclusive of natural gas liquids compares with 10,406,700 b/d in June 1950, an increase of 16.5 percent.

Due to the shut-down in Iranian fields production in July was reduced 441,400 b/d to 11,677,900 b/d. The July output, with no oil from Persia, thus was up to the average of the first half year for the world as a whole during which period Iranian fields supplied 662,000 b/d.

Most of the slack was taken up by other nearby fields in the Persian Gulf area although the western hemisphere also increased its output substantially in July. The Burgan field in Kuwait and the various fields in Saudi Arabia have contributed most effectively to the increases in crude output in recent months. Following is a tabulation of output by months of the three largest Persian Gulf fields through July:

Thousands of Barrels Daily

	Kuwait	Saudi Arabia	Persia
January	422.0	561.2	648.0
February	358.8	633.7	700.0
March	375.4	638.9	700.0
April	503.0	695.1	565.0
May	491.4	739.8	719.0
June	528.5	758.7	638.0*
July	650.0*	820.0	——

* Estimated

Production of Iraq fields could be expanded very greatly but this is not feasible at the moment because of a lack of transportation facilities. Iraq officials will not permit reopening of the southern leg of the pipe line to Israel and the northern lines are fully loaded. The new big-inch line to the Mediterranean will not be completed until next year.

Second quarter production was expanded faster than required to meet demand in a number of areas in recognition of the Iranian situation. Had the trouble in Persia not developed it is likely that second quarter output would have been held at about the level achieved in the first three months or perhaps lowered a bit. Stocks of crude and major products in the United States have been increased some 40 million barrels over last year in spite of greatly increased exports of products. With normal output in Persia the United States industry would probably have kept stocks at a somewhat lower level.

Production in Oceania has risen above the pre-war level as a result of substantial increase in both British Borneo and Indonesia. The Borneo fields passed 100,000 b/d some months ago. Output for the half year is estimated at about 103,000 b/d compared with 84,800 b/d in 1950, an increase of nearly 22 percent. Indonesia is producing 149,000 b/d compared with 130,700 b/d in 1950, an increase of 13.7 percent. The region still is dependent on the Middle East and the Western Hemisphere for more than half of its oil supply.

Crude production by countries in the Soviet bloc in the second quarter is estimated at 952,000 b/d compared with 891,000 b/d in 1950. This estimate places Romanian output at about 20,000 b/d below the official government figures which claimed an output of 5,430,000 metric tons in 1950 in line with the plan. Lacking new discoveries the industry in Romania has had to obtain production from older fields by development drilling and special recovery methods. Although 1950 drilling totaled 21 million feet most observers in the western world place crude output at a lower figure, about 86-89,000 b/d. Without new discoveries it is not considered likely that Romanian output will rise to ten million tons in 1955 as planned by government officials.

Austrian output rose sharply last year from 960,000 to 1,250,000 tons and is continuing an upward trend again this year. Current output is estimated at about 40,000 b/d and 1951 production is expected to reach 1.8 million tons. The recently discovered Matzen field is largely responsible for the increase which establishes a new record for Austria. Efforts to increase production in Hungary have not been successful. Current output at about 11,500 b/d is enough to supply the severely rationed domestic market and to export to Russia.

National Petroleum Council
Estimate of Petroleum Availability, January 1951

(Thousands of Barrels Daily)

UNITED STATES

District	Availability: Crude Oil	Availability: Nat. Gas Liquids	Availability: All Oils	Reserve Productive Capacity: Crude Oil	Reserve Productive Capacity: Nat. Gas Liquids	Reserve Productive Capacity: All Oils
East Coast	54	19	73	0	0	0
Mid-Cont.	1,083	72	1,155	6	0	6
Southwest	4,161	383	4,544	636	6	642
Rocky Mountain	350	9	359	58	2	60
California*	1,079	90	1,169	120	7	127
U. S.	6,727	573	7,300	820	15	835

*Including Elk Hills

FOREIGN (Excl. Russian Dominated Areas)

	Productive Capacity: Crude Oil	Productive Capacity: Nat. Gas Liquids	Productive Capacity: All Oils	Reserve Productive Capacity: Crude Oil	Reserve Productive Capacity: Nat. Gas Liquids	Reserve Productive Capacity: All Oils
Canada	165	2	167	70	—	70
Latin America	2,130	22	2,152	4	—	4
Total	2,295	24	2,319	74	—	74
Europe	86	24	110	—	—	—
Middle East	2,000	—	2,000	126	—	126
Far East	270	4	274	5	—	5
Total	2,356	28	2,384	131	—	131
Total Foreign	4,651	52	4,703	205	—	205

World Crude Oil Production
(Thousands of Barrels Daily)

Country	1949	1950	First Quarter 1951	Second Quarter 1951
North America				
United States	5,042.0	5,402.0	5,964.0	6.158.8
Canada	57.5	78.3	90.6	131.5
Mexico	167.0	202.0	210.0	200.0
TOTAL NORTH AMERICA	5,266.5	5,682.3	6,264.6	6,490.3
South America & Caribbean				
Venezuela	1,321.4	1,498.0	1,650.0	1,700.0
Colombia	81.5	93.1	106.0	108.0
Argentina	63.5	65.9	69.0	72.0
Trinidad	56.5	56.5	56.6	56.6
Peru	40.5	41.2	42.6	43.0
Ecuador	7.2	7.4	7.5	7.5
Bolivia	1.9	1.7	1.4	1.2
Cuba	0.3	0.3	0.3	0.3
Brazil	0.3	0.8	1.3	1.3
Chile	0.4	1.6	1.7	1.7
TOTAL SOUTH AMERICA	1,573.5	1,766.5	1,936.4	1,991.6
TOTAL WESTERN HEMISPHERE	6,840.0	7,448.8	8,201.0	8,481.9
Europe				
Romania	85.0	89.0	89.0	89.0
Austria	25.0	28.4	40.0	40.0
Germany	16.3	21.6	23.8	26.0
Netherlands	11.8	13.6	13.6	14.1
Hungary	10.3	11.5	11.5	11.5
Yugoslavia	6.5	7.6	8.2	8.2
Poland	3.3	3.3	3.3	3.3
Albania	6.0	7.7	7.8	7.8
France	1.1	2.4	4.4	4.9
United Kingdom	0.9	0.9	0.9	0.9
Czechoslovakia	0.8	0.8	0.8	0.8
French Morocco	0.4	0.8	1.2	1.2
Italy	0.2	0.2	0.2	0.2
EUROPE EX. USSR	167.6	187.8	204.7	207.9
USSR*	690.0	750.0	800.0	800.0
TOTAL EUROPE	857.6	937.8	1,004.7	1,007.9
*Includes Sakhalin				
Near and Middle East				
Iran	561.0	665.5	683.5	641.0
Saudi Arabia	477.0	546.7	610.5	737.3
Kuwait	242.0	345.0	386.3	507.3
Iraq	85.0	136.2	169.4	173.0
Egypt	43.5	45.3	43.9	44.6
Bahrein	30.0	30.0	30.0	30.0
Turkey	0.3	0.8	0.8	0.8
Qatar	—	33.7	46.7	49.0
TOTAL NEAR & MIDDLE EAST	1,438.8	1,803.2	1,971.1	2.177.0
Far East & Oceania				
Indonesia	115.9	130.7	149.5	148.6
British Borneo	70.5	84.8	102.0	104.9
New Guinea	4.8	4.8	4.8	4.8
India	5.3	5.3	5.5	5.2
Japan	3.7	5.7	6.1	6.2
China	2.0	2.0	2.0	2.0
Pakistan	2.6	3.5	3.4	3.7
Burma	1.0	1.6	2.0	2.0
TOTAL FAR EAST & OCEANIA	205.8	238.4	275.3	276.5
TOTAL EASTERN HEMISPHERE	2,502.2	2,979.4	3,251.1	3,461.4
WORLD TOTAL	9,342.2	10,428.2	11,452.1	11,943.3

Exporting nations in the Soviet bloc include Romania, Austria, Hungary and Albania. Poland, Czechoslovakia, Bulgaria and the U. S. S. R. are net importers. East Germany is an exporter of hydrogenation and Fischer-Tropsch plant products. Synthetics production in East Germany, Czechoslovakia, Poland and Bulgaria is helping to make up the shortage of other communist countries. Coal-oil plants in the Soviet bloc are producing 30-40,000 b/d of liquid hydrocarbons bringing the total oil supply close to a million barrels daily.

Crude production of South American and Caribbean nations increased 11 percent in the first half of 1951 to 1,964,000 b/d. Average output in 1950 was 1,766,500 b/d. Principal increases were in Venezuela and Colombia. Of the 197,500 b/d increase Venezuela contributed 177,000 b/d and Colombia 14,000 b/d. South America produced 16.8 percent of the world's oil supply in the first half compared with 16.9 percent in 1950 and 16.8 percent in 1949.

Crude production in Venezuela in the first half year averaged about 1,675,000 b/d as compared with 1,498,000 b/d in 1950, an increase of 11.8 percent. By mid-year output was averaging 1,700,000 b/d. At this rate Venezuela was supplying 14.3 percent of the world's crude oil, about the same share as in recent years.

Venezuela had 9,550 producing wells at mid-year with an average daily output of 178 barrels per well. With nearly 100 rigs running, completions now are at the rate of 100 wells per month of which average success ratio is about 95 percent. The high success ratio plus the good yield per well is a stimulus to greater field development activity under present conditions.

Colombian production has been rising steadily for the past two years and now is well above 100,000 b/d. Average for the second quarter was 16 percent above last year. Argentina, third largest producer in South America, also has been drilling more actively in an effort to reduce imports. Current output is about 72,000 b/d, an increase of nearly 10 percent over 1950.

North America produced exactly the same proportion of the world's supply of crude in the first half of the year as in 1950. Mexico kept its production steady at a little over 200,000 b/d and the United States increased its output 379,000 b/d to 5,061,000 b/d. Canada was able to open many wells in the Prairie Provinces when melting ice permitted navigation on the Great Lakes and the Superior, Wisconsin, terminal of the Interprovincial Pipe Line went into action. Total Canadian production rose from 78,300 b/d in 1950 to 90,600 b/d in the first quarter and then jumped to 131,500 b/d in the second quarter. By the end of July output was 165,000 b/d, more than double last year's average.

Percentage Distribution of Production

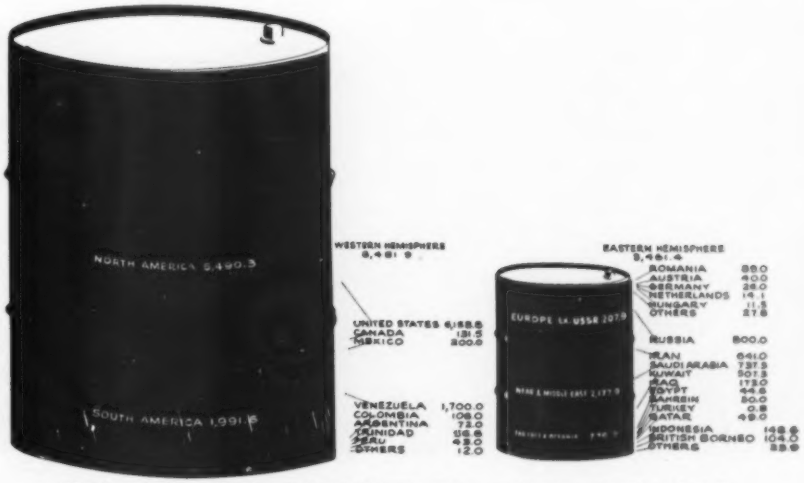
Principal Nations	1939	1949	1950	Six Months 1951
United States	60.	55.5	52.0	51.9
Venezuela	9.8	14.2	14.4	14.3
USSR	10.5	7.4	7.3	6.9
Iran	3.7	6.0	6.4	5.7
Saudi Arabia	0.2	5.1	5.3	5.8
Kuwait	—	2.6	3.3	3.8
Western Hemisphere	76.7	73.3	71.5	71.4
North America	63.2	56.5	54.6	54.6
South America	13.5	16.8	16.9	16.8
Eastern Hemisphere	23.3	26.7	28.5	28.6
Middle East	6.0	15.4	17.3	17.7
Oceania and Far East	4.1	2.3	2.3	2.3
Europe (including USSR)	13.2	9.0	8.9	8.6

An estimate of future petroleum producing capacity in the United States and other non-Russian areas of the world was made by the National Petroleum Council committee on oil and gas availability in July. The report estimates that productive capacity including natural gas liquids totaled a little over 12 million barrels daily at the start of this year. This compared with actual production at that time of 10.9 million barrels daily.

By the end of 1955 says the report, the total capacity of the free world may be as high as 16 million barrels daily, an increase of 33 percent. A lower estimate of 13.8 million barrels daily also is furnished. Whether the higher or lower estimate will be reached depends upon economic and political conditions outside the control of the petroleum industry as well as success in drilling. There is no question, it adds, of the ability of the industry to do this job, given the men and materials and a free market.

L. F. McCollum of Continental Oil Co. is chairman of the committee which presented two sections of a three-part report at the last council meeting on July 24. One part estimated the United States domestic output through the next five years, a part prepared by a subcommittee under Hines H. Baker, of Humble Oil & Refining Co. A second part estimated foreign output for each of the next five years, this section prepared by a subcommittee under John R. Suman of Standard

(Please turn to page 104)



World production of crude oil, first half, 1951. Figures are in thousands of barrels daily.

Western Canada Makes Notable Progress In Oil Industry Development

By J. L. Irwin

Wildcat rig in the Birtle area of southwestern Manitoba. All photographs with this article courtesy Imperial Oil Ltd.

NINETEEN fifty-one is destined to stand as an historic year in the progress of Canada's petroleum industry. Ignoring international crises, credit restrictions and declining trends in various commodity markets and difficulties in material supplies, the record of the past half-year has been one of expanding activity in every branch of the industry. The outlook for the remainder of the year is one of continued expansion from the status of a provincial to a national or perhaps an international position in the world of oil.

Production for the first six months of the year shows an increase of around 7,000,000 barrels in comparison with the same period in 1950. The total for May and June was not very much under the total for the first four months. It was in the latter half of this period that lake tankers, for the first time in history, carried Alberta oil to eastern Canada. Allowables on producing wells were increased to meet the new demand and a most important new chapter was thereby opened.

Increased footage was drilled in both established fields and wildcat areas, geophysical survey continued and enlarged upon its activities, and exploratory work was noticeable over a widespread area. New refineries were opened, and established ones enlarged.

All four of the western Canadian provinces are now definitely into oil development. Important new developments regarding British Columbia's search for oil are to feature the second half of the year. Exploratory drilling is at a new peak in Saskatchewan. Manitoba, after many years of research, has brought in its first oil production in the Virden area in the southwest part of the province.

The following figures represent barrels, each of 35 imperial gallons. They represent also the estimated totals for oil produced in Alberta fields during the first half of 1951, the figures in brackets being the official totals for the same period in 1950: Redwater, 9,464,414 (3,934,730); Leduc, 5,614,867 (4,893,137); Turner Valley, 1,552,049 (1,942,800); other fields and areas, 2,068,726 (1,012,203); Alberta totals, 18,700,056 (11,782,870).

The estimated gross value of crude oil to producers for the first half of 1951 is given at approximately $50,000,000 to compare with the official valuation of $35,676,283 for the same period last year.

As has been stated, totals for the first four months do not differ greatly from those of the last two months of the 1951 half year period. This is particularly so in the case of Redwater where the estimated total for May and June exceeds the total for the previous four months by about 140,000 barrels, which emphasizes the increased throughput demand made by the Interprovincial pipe line as a result of tanker movement to Ontario. Daily production average for May and June in 1951 for Redwater was 78,692 barrels to compare with Leduc's daily average of 40,944. Alberta's daily average for these two months was 142,062. Of the estimated Alberta increase in production of around 7,000,000 barrels for the half year, Redwater contributed about five and a half millions, Leduc about 700,000 and other fields and areas about one million. Turner Valley's decline was around 400,000 barrels. April opened with a daily average of 45,623 barrels, the lowest figure of the period. The month closed with 60,904. With the coming of May there was an immediate change with daily averages from over 100,000 barrels to a high of 167,004 barrels for the weeks ending June 18.

Footages drilled in Alberta in the first four months of 1951 are given as follows, the figures in brackets representing totals for the same period in 1950: Leduc, 465,396 (269,750); Redwater, 258,436 (385,679); other producing areas, 182,131, (113,537); wildcat areas, 498,117 (251,674); Alberta totals, 1,404,080 (1,020,640).

The number of producing oil wells in Alberta actually operated at the close of April 1951, totalled 1,953, to compare with 1,180 at the same time in 1950; the number capable of being operated at these same dates came to a total of 2,217 for the present year in comparison with 1,430 in 1950. The total number of wells drilling on these dates was 164 for this year with 133 for last. Contributing to these totals, as of April 30, 1951, (the figures representing producing oil wells actually operated, and those in brackets capable of being operated) were the following fields: Redwater 808, (821); Leduc 576, (605); Turner Valley 286, (329); and Lloydminister 78, (176). Oil discoveries were made in four new areas, and natural gas in 17 throughout the province.

By the close of the half year, Alberta had 22 oil fields and 15 oil areas, the latter mostly containing the one discovery well in each, making a total of 37 fields and areas from which production was being taken at that date.

Of the 22 oil fields, the first 12 in order of importance as to productive capacity, are as follows: Redwater, Leduc, Turner Valley, Lloydminister, Joseph Lake, Stettler, Golden Spike, Excelsior, Acheson, Taber, Conrad and Big Valley. In southern Alberta are Turner Valley, Taber and Conrad; Lloydminister is some 200 miles east of Edmonton on the Alberta-Saskatchewan border; Stettler is about 100 miles south of Edmonton, and Big Valley is just south of Stettler. The rest are all in the Edmonton area.

Since the Leduc field's discovery in February 1947, the amount of risk capital introduced into Alberta, and later throughout western Canada, for the purpose of oil development on a great scale, has reached a very high figure. The total is estimated to be around $600 million by the close of the present year, $500 million of which will have been spent in Alberta. In round figures, the annual totals spent in Alberta for this specific purpose are given as follows: 1947, $36 million; 1948, $100 million; and 1949 and 1950, $150 million for each year. The present year's total will probably reach $200 million.

Survey work is of course the first consideration in the oil exploratory program. This has been on an intensive scale in the past four and a half years and is being continued and enlarged in 1951. Research work from the air is also continuing.

Specially equipped aeroplanes and two or three helicopters are engaged in photographic

Recently completed Winnipeg refinery of Imperial Oil Ltd.

and other forms of aerial survey. Exploration of this nature, added to many land surveys, has covered areas extending all the way from Pincer Creek in the southern portion of Alberta to the vast Peace River region in the north.

The area under survey now in western Canada is placed at roughly one hundred million acres, approximately half of the considered favorable territory of this great domain. A great deal of seismograph survey work is being carried out in the north of the province. It is very active also in the south, due partly to increased natural gas development there.

Geophysical survey work is being carried out at present in western Canada by 101 parties. Of this total 77 are in Alberta, 68 of which are seismograph parties and nine are gravity meter. Alberta's oil survey work is now second only to that of Texas in North America.

At the close of the half year, F. G. Winspear, president of the Chamber of Commerce, stated on his return from a visit to Britain that the possibilities of Alberta's vast accumulation of oil sands had created lively interest there, and that the British people possessed a widespread knowledge as to the potentialities of these oil sands. At the time the trouble in Iran started, a party of Anglo-Iranian Oil Company officials arrived in Edmonton to see if S. M. Blair's report could really be true. As the news regarding Iran had not broken when they left Britain, the timing of the two events was coincidental and not significant. Mr. Blair, prominent petroleum engineer, for some time in the employ of the Alberta government to conduct an exhaustive survey of Alberta's oil sands, produced a comprehensive report which among other things stated that development was now feasible on an economic basis.

Dr. J. L. Robinson, Minister of Industries and Labor of the Alberta government, announced recently the holding of a symposium during the second week of September for the purpose of discussion and investigation into the world's greatest known petroleum deposits lying in northern Alberta. Meetings are to be held in Edmonton, McMurray and Bitumount, the latter two places adjoining the deposits, and experts from Canada and the United States are expected to be present. A plant for processing the sands has been constructed at Bitumount by the Alberta government. It is expected that visitors will include technicians from the Anglo-Iranian and French petroleum companies together with representatives of other companies as well. Dr. G. S. Hume, director-general of scientific services of the Canadian government, will read a paper on the components of the sands, S. J. Kidder on methods of mining, and Dr. K. A. Clark of the University of Alberta on bitumen and sand.

Dr. Robinson will head the committee to be formed. Members are H. H. Somerville, director of mineral rights and assistant deputy minister of mines and minerals of the Alberta government; Dr. Robert Newton, director of the Alberta Research Council; S. M. Blair, technical director of the symposium, and H. P. Rocke of the Alberta government marketing board, and operating manager of the symposium. One of the highlights of this general meeting will be a detailed statement of government policy regarding the exploitation of the oil sands.

On April 23 the first five tankers to carry Alberta oil to eastern Canada left Superior, Wis., bound for Sarnia, Ontario, with a load of 209,048 barrels of oil.

Included in this historic fleet were the two new vessels of Imperial Oil Co., Imperial Leduc and Imperial Redwater, launched last fall, the largest fresh water tankers in the world. Each has a capacity of 115,000 barrels. The two will deliver about ten million barrels of oil a year to the Sarnia refinery. A third ship of the same tonnage and capacity is under construction by Imperial Oil and is expected to be ready for service next year.

A lake tanker is to be constructed for British-American Oil Co. and is expected to be ready for operation by the fall of 1952. Cost of the vessel will be $4,500,000. It will have the same capacity as the Imperial boats, 115,000 barrels. Approximately 29 deliveries will be made each year. B-A's new tanker will carry Alberta oil from Superior to the company's refinery at Clarkson, Ontario.

Lloydminister, with its production of black oil, has made a considerable contribution to western Canada's oil industry, particularly in the past four years. The by-products of this heavy petroleum are coming more and more into demand. The Lloydminister producing area is extensive in size. It lies partly in Alberta and partly in Saskatchewan and is at present approximately 44 miles from north to south and 42 miles from east to west, containing about 400 producing wells.

There is a growing market for this product from power plants and railway locomotives which are converting to oil, for its superfine quality of asphalt to fill extending road building programs and for its industrial, agricultural and domestic oils.

The Devon Oil Show, held in the new town of Devon in Leduc, took place in the latter part of the week ending July 7. Every phase of the oil industry, exploration, geology, seismograph, drilling and production, took part

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Imperial Leduc, world's largest freshwater tanker which brought the first cargo of western crude to Sarnia last April 24.

Keel plates being laid at Collingwood shipyards for a third large 620-foot tanker to bring western crude from the Superior, Wis., terminal of the 1,126-mile Interprovincial line to central Canadian refineries.

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in the exhibition, which was organized by the Devon Lions Club and officials of the industry. The new bridge across the Saskatchewan River, connecting the Leduc and Woodbend fields at Devon, was officially opened.

A record was established on May 10, when at an auction sale conducted by the government of Alberta, a total of $4,724,382 was realized for the disposal of lands for oil exploration rights. This, added to the sale last January, which totalled $2,004,828, made a total for the year, as of May 10, of $6,729,210 for lands of this category.

The highest price ever to be received in the province of Alberta for a single reservation of petroleum and natural gas rights, $506,492, was paid at this sale by George F. Chadburn, land agent for Seaboard Oil Co. of Delaware. The reservation consisted of 11,174 acres of provincial crown lands in the Bittern Lake area, 16 miles east of Wetaskiwin, and about 50 miles southeast of Edmonton.

A story of interest to the Edmonton oil area is the coming development on the Chamberlain farm, three miles east of Edmonton's city limits. Mr. and Mrs. Chamberlain, who celebrated their golden wedding a few months ago, and who have resided on this farm for over half a century, started to drill for oil on the property in 1911. Between that year and the first World War drilling was intermittent, due largely to primitive equipment in use. Natural gas in commercial quantities was discovered at an approximate 2,000 foot level but the depth for oil discovery was never reached.

A new company, the Chamberlain Oil & Gas Co. Ltd., was recently formed. Financing is being arranged by outside interests, and the venture started and financed by Mr. Chamberlain 40 years ago, is to be completed this year. A test for oil immediately east of Edmonton has not yet been made. For sentimental as well as industrial reasons, this operation will be watched with considerable interest.

A prediction of oil discoveries in the Maritimes was made at Charlottetown, Prince Edward Island, early in July by John R. White, executive vice president of Imperial Oil Co., speaking at a dinner given by the Maritime Regional Council of the Junior Chamber of Commerce. Surface indications, he stated, existed in Nova Scotia, New Brunswick, the Gaspé Peninsula and Newfoundland.

Search for oil in the Maritimes up to date has cost about $5,000,000. About 167 exploratory wells have been drilled and it is understood that the oil companies who have conducted this work are prepared to spend further millions in this search.

The province of Manitoba in the present year has definitely entered the Canadian oil picture. Accompanying the opening of a major oil refinery at Winnipeg was the discovery of oil in the southwestern part of the province. The first exploratory well was drilled 78 years ago, but the present year is the first to show recovery of oil in a Manitoba well. The productive area around Virden in the southwest is said to be extensive and exploratory work is being carried out on a considerable scale.

With the opening of the British American Oil Company's new refinery on June 27 in Edmonton, the capital city now boasts two major refineries, Imperial's large plant having been established about a year and a half after the discovery of Leduc. A third major refinery is expected to be completed this year in Edmonton by McColl Frontenac Co., bringing the number up to three. B-A's refinery was opened by the Hon. E. C. Manning, premier of Alberta. The Premier had turned the first sod for its construction work in May 1950. Present at the ceremony were officials of the government and the company, the latter being headed by President W. K. Whiteford.

Embodied in the new plant is Alberta's first catalytic cracking unit, which makes possible the production of high octane gasolines necessary for today's high compression automobile engines. This is the second catalytic cracking unit to be erected by the company. The first operates at the B-A Montreal East refinery and is Canada's largest.

The northern part of Alberta and parts of Saskatchewan and British Columbia will be served by the new refinery. Crude oil will be fed to the plant by pipe line from nearby fields. Capacity of the plant is at present in excess of 5,200 barrels daily. Water is taken from the North Saskatchewan River.

Less than a week before this event, June 21 being the date, Imperial Oil Co. opened its new refinery at Winnipeg. Cost of construction was $10 million. With Premier D. L. Campbell of Manitoba closing a switch which started gasoline from the new plant flowing into a tank car, the refinery was officially opened. G. L. Stewart, president of Imperial, together with other government and company officials attended the ceremony. Equipment of the plant also includes a fluid catalytic cracking unit, the first to make its appearance in western Canada.

Resulting from the establishment of a major refinery, Manitoba will no longer be dependent on eastern supply of oil which has had to be hauled by tanker or rail over long distances. The crude oil feeding the plant comes from Alberta, reaching the refinery via the Interprovincial pipe line to Gretna, Manitoba, and by the Winnipeg pipe line from Gretna, to Winnipeg.

Crude oil from Alberta has now reached the refinery of Canadian Oil Companies, Ltd. at Petrolia, Ontario, where the world's first pumping oil well made its appearance 93 years ago. A new $20 million refinery is under construction by this company, with a capacity of 20,000 to 22,000 barrels daily, near Sarnia, Ontario, and will be ready for operation in a year's time.

At the beginning of the present year, the Alberta government announced that no export of natural gas was to be permitted at that time due to insufficiency of reserves. On the basis of industrial and domestic requirements for the next thirty years, it was stated, proven reserves so far established barely balanced the requirements in question.

Some weeks prior to this announcement, a report was released by Dr. G. S. Hume, director-general of scientific services, government of Canada, and A. Ignatieff of the Mines Branch of Canada. The report dealt with a survey made relative to Alberta's natural gas reserves as at that time known.

Proven reserves were said to be 2,798.4 MMMcf and probable or indicated reserves were 4,193.7 MMMcf. These estimates were for Alberta alone. The total of proven and probable reserves added up roughly to seven trillion cubic feet.

Since the government's announcement, an active exploratory program in gas search has been carried out, areas having been tested all the way from northwestern Alberta and northeastern British Columbia down to the southern part of Alberta.

In November 1950, with Alberta gas export approved for Dawson Creek, B.C., the start of the Alaska highway and only 17 miles from the Alberta border, the pipe line construction was finished and gas was supplied to this town. The source of this gas was in northwestern Alberta. A total reserve for this area alone was given by engineers of the Westcoast Transmission Co., responsible for operations, of 1,132 billion cubic feet, of which 510 billion was given as proven, and 622 billion as probable.

In addition to the above activity in this sector, gas exploration work has been actively carried out all over the province since the date of the government's announcement. In view of this, it will be interesting to watch proceedings when the Conservation Board in September reopens its hearings so that applicants for gas export may once again present their claims.

By the close of March of this year, export of Alberta gas to Montana was approved on a limited basis and for strategic purposes only. Source of the gas was in the Pakowki Lake

Leslie M. Frost, premier of Ontario, speaking at ceremonies welcoming the first cargo of Western Canada oil to Sarnia.

area of southern Alberta. The gas is to be used for operations of the Anaconda Copper Mining Co. and the American Smelting and Refining Co., Montana. A maximum flow, limited to 40 million cubic feet daily, is to go from the joint gas holdings of the McColl-Frontenac Co. and the Union Oil Co. of Canada to the companies in Montana. The permit, for a period of five years, after which the situation is to be reviewed, is described as purely a defense measure and not to be confused with gas exports for any other purpose. Five more wells are to be drilled by the Department of National Defense of Canada to create a greater supply of gas for military purposes. The department's gas area is near Suffield in southeast Alberta.

After years of no market for sulfur, compared with the sudden new demand for this product, the Royalite Oil Co. is to build a sulfur processing plant in Turner Valley, and Shell Oil will build another at Jumping Pound, just northwest of Calgary. It is reported that the British Columbia pulp and paper manufacturers will contract for all the sulfur obtainable from Alberta's natural gas.

New gas areas are being established in Alberta continually. It has been estimated that the Many Islands gas area, northeast of Medicine Hat, is approximately the size of the Pakowki-Manyberries field. Near Okotoks, 30 miles south of Calgary, another major field has been established.

Additional gas for industrial use is already in demand. The big plant of the Canadian Chemical Co. at Edmonton, to cost $50 million, will require large quantities of gas for its operations. A huge extraction plant for Sherritt Gordon's nickel-copper development is to be built near Edmonton for two reasons; one because of the availability of gas for fuel and power in considerable quantity at low cost, the other because the process would develop an important by-product in ammonium sulphate fertilizer. This will prove a desirable factor in western Canada's agricultural economy.

Alberta's gas companies for home consumption, Northwestern Utilities in Edmonton and Canadian Western Natural Gas Co. in Calgary, have expanded much in the past half year due to increased demand. Jumping Pound is allied with Turner Valley now for feeding southern Alberta, and Leduc has joined forces with Viking-Kinsella for the Edmonton area.

As of April 30, 205 gas wells were actually operated in Alberta with 303 capable of being operated, to compare with 161 actually operated at the same time last year with 249 capable of being operated.

On the chilly afternoon of October 4, 1950, Premier E. C. Manning opened a valve at the pump station at Edmonton and Alberta's oil entered the nearly completed Interprovincial pipe line on its way to Superior, Wis. Tankage capacity for 1,800,000 barrels waited for the oil at the Superior terminal. That capacity is now being increased to 4,400,000 barrels. With the completion of this work the oil will be able to run through the line for a much longer period in the winter season. As already stated, the first tanker fleet to carry Alberta oil to eastern Canada started on April 23 of the present year. With the opening of the Winnipeg refinery on June 21, the Winnipeg pipe line running between Gretna, Manitoba, on the Interprovincial line and the new refinery went into steady operation.

Announcement now comes from the Imperial Oil head office of a projected products pipe line to be constructed from Sarnia to Toronto. It will consist of about 125 miles of 12-inch pipe and about 60 miles of 10-inch. Deliveries will be made of gasoline, diesel and furnace fuels to terminals in London, Hamilton and Toronto. Initial throughput will be 28,000 barrels per day. Cost of the line is estimated at $9 million and when completed a staff of about 60 will be required to operate it. The line is expected to go into service in 1952.

The Edmonton Pipe Line Co., sponsored by four companies, Superior Oils, General Petroleums, Kroy Oil and Jupiter Oils, is to construct a line between Joseph Lake oil field and the Interprovincial Pipe Line station just east of Edmonton. Headquarters of the new company will be in Calgary. Construction of the 20-mile line began in August. When finished, it is expected that transportation costs to Edmonton will be cut in half.

In addition to the ever present question of pipe line construction from Alberta to the Pacific coast for the transport of Alberta gas, is the question of similar construction for the transport of Alberta's oil.

The prevailing opinion is that action on the latter question of transport of oil to the Pacific coast is not far away. There is no official pronouncement as yet in this matter. An important factor is whether Alberta's oil reserves at the present time would justify this major construction job in addition to the Interprovincial line. There is very little doubt that it will be justified in a future not far distant.

When such justification comes, it will of course be necessary also for Alberta oil to enter the states of Oregon and Washington for a share of that market large enough to justify the construction cost of such line. Consumer demand in those two states, plus the British Columbia area, totals at present about 300,000 barrels daily. This figure is only about 60,000 barrels per day less than the present total oil requirements for the whole of Canada.

There are five applicants for permission to construct an oil pipe line from Alberta to the Pacific Coast. They are as follows: Westcoast Transmission Co., sponsored by Pacific Petroleums Ltd. of Calgary, Alberta; Alberta Natural Gas Co. and Northwest Natural Gas Co.; Trans-Mountain Oil Pipeline Corp.; Border Pipeline Corp.; and Independent Pipeline Corp. Alberta Natural Gas Company and Northwest Natural Gas Company are sponsored by Brokaw, Dixon and McKee of New York; Trans-Mountain Oil Pipe Line Corp. is sponsored by Bechtel Corporation; and Independent Pipeline Corp. is sponsored by Federated Petroleums Ltd. of Calgary.

An oil pipe line from Alberta to the Pacific coast would call for considerable refinery expansion, not only in Vancouver but no doubt in Washington or Oregon as well.

An undertaking of this size would mean a great step forward for the oil industry of western Canada. The advancement would be of first importance industrially, and from a strategic viewpoint it would represent a national safeguard in case of emergency. Alberta's oil is now traveling by pipe line and tanker to eastern Canada. There is a strong likelihood that in the near future it may be transported by pipe line to the Pacific coast as well.

An Imperial seismograph party operating in the Willston Basin south of Moose Jaw, Saskatchewan, near the international boundary.

Steel Allocations Held Short of Industry's Needs

EFFORTS of Secretary of Interior Chapman and the Petroleum Administration for Defense to obtain fuller recognition of the steel needs of the oil industry have had a modicum of success in gaining a small increase of a little over 200,000 tons for the fourth quarter. This is still short of the figure approved by the iron and steel division of the National Production Authority, is 328,000 tons below the minimum figure set by PAD and represents only 75 percent of actual needs as calculated by industry representatives.

Of the total allotment of 1,806,500 tons for petroleum uses 485,000 is earmarked for oil country tubular goods and other field supplies, 625,000 tons is heavy plate, the greater part intended for large diameter pipe, 200,000 tons for oil field machinery and equipment and 496,000 tons for all other uses. Users of line pipe receive a boost of 35,000 tons in their allowance. Provision of metals for alloy uses such as copper and aluminum was cut about 25 percent. The allowance of steel for drilling is considered sufficient to permit the carrying out of the drilling program of 43,000 wells. In the matter of line pipe however the outlook is less encouraging.

Strong arguments were used in support of the plea for more liberal treatment of the oil industry in the matter of steel. Stress was laid on the prospect that it would be necessary for the United States to increase its export of petroleum products as a consequence of the suspension of operations in Iran. Secretary of Interior Chapman suggested that 475,000 barrels daily of American oil might be required to fill the gap left by the Iranian shutdown. In a letter to Senator Styles Bridges he wrote:

"You can be assured that everything possible will be done to make full use of all available crude oil and refining capacity in foreign areas before supplies are obtained from the United States to replace Iranian production.

"In spite of the most strenuous efforts to obtain supplies abroad, however, considerable quantities of petroleum from the United States will be required to offset completely the loss of Iranian oil.

"The amount needed from the United States is approximately 475,000 barrels daily, which represents seven percent of our domestic consumption of petroleum in the second quarter of this year.

"In considering the Iranian question we are conscious of the fact that by completely solving the problem we may create shortage in various parts of the United States. Therefore, we are taking steps to keep informed as to the increases in exports so that if they reach proportions which we believe are detrimental to the domestic economy we can exercise our influence to stop excessive withdrawals."

Another phase of the situation was emphasized in the prediction that unless more pipe could be supplied to gas transmission lines a tight situation in the supply of natural gas would develop during the coming winter months with possibly a serious shortage in certain areas. This prospect was regarded by PAD as sufficiently serious to justify a restriction upon gas commitments by suppliers and a tentative order was drafted forbidding the taking on of new customers by gas distributors. The proposal drew strong protests from gas appliance manufacturers. Several meetings between PAD and representatives of the gas industry were held leading to a plan for working out an agreement with the various states according to local conditions.

A third factor that had led to some sharp exchanges and strong criticism of the Defense Production Administration is the need of pipe line outlets for crude production in certain areas. Discussion of this question has revolved largely about the Platte Pipe Line Co. which is building a crude oil line from Wyoming to Chicago. It is claimed that the line will provide an outlet for 100,000 barrels daily of crude production. It was planned to complete construction by the end of this year but failure to obtain line pipe has put off the completion date until mid-1952 according to the company's president, Millard Neptune. Platte officials took their story to the Petroleum Administrator and also to Congress.

As an upshot of the case Senator O'Mahoney's sub-committee of the Senate Interior Committee held a two-day hearing on the steel needs of the oil industry in general and the Platte case in particular. The hearing developed some acrid criticism of the Defense Production Administration on the charge that it had whittled down PAD's request for steel for the industry by about 30 percent in the third quarter and by a less amount in the fourth quarter. Following the hearing the Platte Company was allocated 52,000 tons for the fourth quarter.

While there is a feeling among many oil men that in view of the high targets set for their industry in the program for national security, it has not received fair consideration from the Defense Production Administration in the allocation of steel and other scarce materials it is recognized that DPA is bombarded with claims and counter claims from many industries and that it is difficult to adjudicate all these demands equitably. The prevailing sentiment seems to be that while the industry has not received the full consideration it deserves it will do the best with what it gets and will try to satisfy essential demands.

Meanwhile the industry's committee on foreign supply which was established earlier in the Iranian crisis has proceeded with its plans for aiding as may be necessary in meeting shortages that develop abroad. Even though the negotiations in Teheran should result in a working agreement for handling Iranian oil considerable time must elapse before full scale operation can be resumed, especially in view of the wide dispersal of Anglo-Iranian's tanker fleet which is now engaged in moving oil from other points to supply needs in Europe and elsewhere. On August 7 Deputy Petroleum Administrator Bruce K. Brown issued a statement urging extraordinary efforts by the American oil industry to aid in meeting the situation created by the unexpected suspension of the 600,000-barrel daily Iranian production.

Noting the action already taken by international companies to step up production in other parts of the Middle East and elsewhere and to divert shipments to Europe, Mr. Brown said: "These measures, however, will still leave a deficit of 230,000 barrels daily of refined products which can be entirely offset only by United States exports. Export of around 230,000 barrels a day can be supported for a limited time only without adversely affecting the domestic supply situation.

"But to maintain this level over any extended period will require increased output of both crude and refined products here.

"Much has been done already but more remains to be done if producers and refiners are to play their full part in fueling the free world. Nothing less than extraordinary efforts by these segments of the industry will be adequate."

Reports to the American and Overseas supply committees early in August indicated that a 500,000-barrel daily supply of crude and products had been found to replace Iranian oil, including 275,000 barrels per day from the Western Hemisphere. Movement from the United States was expected to reach possibly 200,000 barrels daily in August, an amount which could be withdrawn from existing stocks as a temporary measure.

A report at the beginning of August showed that purchases from American companies, including oil produced in the United States and in other countries, for future delivery had amounted to upward of 30,000,000 barrels. Of this 9,962,000 barrels consisted of Middle East crude diverted from projected shipments to the United States. Most of the remainder was refined products from Atlantic and Gulf ports. About 1,000,000 barrels of gas oil and heavy fuel oil had been purchased from the Caribbean.

During July, it was reported 3,885,000 barrels of products had been shipped from the United States and 2,772,000 from American owned companies in the Middle East. Supplies provided through efforts of the American and Overseas committees were considered adequate for most essential needs but a tight situation in aviation fuel has led to some curtailment in air service to the Middle and Far East.

Colombia Enters an Active and Promising Oil Era

By E. Ospina-Racines

COLOMBIA is entering a new and active era of oil exploration and development. This may be attributed to a number of legal, economic and industrial measures and events of the past twelve months.

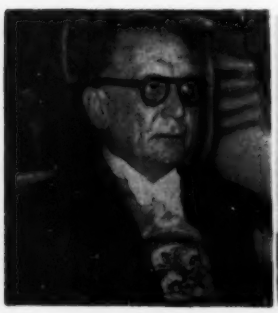
During 1950 and this year, the government, under President Laureano Gomez, who took office a year ago, on August 7, 1950, decided to take measures to stimulate exploration and promote oil developments in the country. As a result the oil law was amended substantially and practically all the difficulties of the existing oil law were eliminated; the oil industry has enjoyed stable labor conditions; the price of the dollar was increased from Ps 1.95 to Ps 2.50 per dollar, thereby increasing Colombia's world market price for crude in terms of pesos, 28.2 percent; 16 oil concessions have been contracted by the various oil operators within the past 12 months, as against a maximum of seven in any one year heretofore; two contracts have been successfully concluded between the government in behalf of the official oil enterprise, Empresa Colombiana de Petroleos, and International Petroleum (Colombia) Ltd. the Jersey Standard affiliate in Colombia, to assure continuity of De Mares oil operations taken over by the Empresa on August 25, 1951. One of the contracts with Intercol is to continue and intensify oil production in De Mares through technical assistance Intercol will lend to the Empresa during the first five years; the second contract deals with the lease to Intercol of the present Barranca 25,000 b/d topping plant, the construction and operation of a new and modern 35,000 b/d topping and catalytic cracking plant, carrying with it a loan from Intercol to the Empresa for such purposes of $10 million. Construction of several oil products pipe lines is being planned, one of which is under construction by Williams Brothers; wildcatting of the past 12 months has been very encouraging and the discoveries promise to become important oil fields; Colombia's oil output has reached 111,000 b/d as against an average of 93,300 b/d in 1950 and 83,000 b/d in 1949. All of these developments and significant events foretell a promising and active era for Colombian oil.

What may be termed a revival of Colombia's oil industry after a protracted lull, may be attributed in a great measure to the energetic and youthful Minister of Fomento, Dr. Manuel Carvajal, an enterprising and successful businessman, head of several large commercial and industrial enterprises, who, upon entering the President's cabinet a year ago, first made a quick and thorough survey of the Colombian oil industry and read practically all the literature available on Colombian oil. Following this and conferences with the Ministry staff and with the oil companies, the symptoms were analyzed and a decision was reached to recommend and adopt the measures which have brought about such effective results, all of which will eventually translate themselves into greater benefits to Colombia's economy.

Referring to the accompanying index map of current oil activities a brief outline of some of these significant oil developments may be made. Seven operators are active in Colombia: five major oil companies, Socony, Texas, Standard of California, Standard of Jersey, Shell, one independent — Guiberson of Dallas, Texas — and the official oil enterprise which took over De Mares on August 25 last, the Empresa Colombiana de Petroleos.

As may be seen from the data of Table I, the six oil producing properties averaged 93,313 b/d last year and during June last the average was 111,345 b/d a notable increase in six months. Colombia's bottleneck in oil output is the maximum capacity of the two crude oil pipe lines, shown on the map, the Andian, which is good for 70,000 b/d and transports oil from De Mares, Yondo, Cantagallo and Dificil fields and the Sagoc which carries 27,000 b/d of Barco crude. The Andian has 13 pump stations with two loops, one of which carries Shell crudes and the other De Mares crude. The latter is made up to the extent of about two-thirds by reduced crude from Barranca topping operations which is a high viscosity blend to transport.

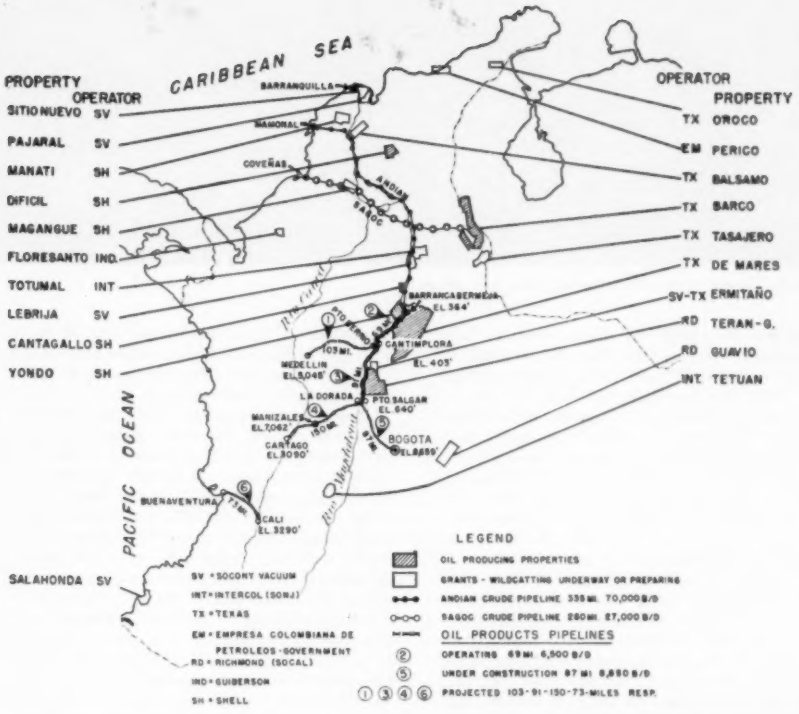
Wildcatting and development drilling has picked up appreciably. As may be seen from the map the exploration blocks are identified with the operators as follows: Socony holds four concessions, two on the Caribbean coast, one on the Pacific and one in the mid-Magdalena valley. Intercol (Tropical) is drilling in the Balsamo block where No. 1 is now around 10,706 feet, having encountered two promising oil sands below the 9,300 foot level and in Totumal in the mid-Magdalena where No. 1 spudded July 2 is now drilling at 5,000 feet. Shell wildcatted in the Nagangue block early this year. Having completed No. 1 at 7,021 feet, it encountered basement and subsequently surrendered the concession. Manati just above will be prospected with the drill this year. As may be seen from Table I, Shell has completed 214 wells in the Yondo block as of December 31, 1950 and 256 as of June 30, 1951, or 42 wells in six months. The Cantagallo concession, just north, prospected



Dr. Laureando Gómez, president of Colombia.

Luis Emilio Sardi, manager of Empresa Colombiana de Petroleos.

Gabriel Cuervo, president of the Petroleum Council.



Map showing location of concessions of various operators in Colombia.

Dr. Manuel Carvajal, Minister of Mines and Petroleum.

Tetuan No. 1, Texas Petroleum Company's discovery well in the upper Magdalena valley.

and developed by Socony, was recently acquired by Shell and the transfer is pending approval of the government at this writing. From the map and the data of Table I, it is readily appreciated that Shell, operated from the Yondo concession, can exploit the Cantagallo property more economically. 1950 data on Cantagallo and Yondo appear in Table I.

Texas has two important discoveries, the Velasquez field in its Teran-G. fee property producing last year an average of 1,079 b/d from five wells. Twelve wells have been completed to June 30, 1951 and seven are producing. A 60-kilometer six inch crude pipe line is being laid from Velasquez field to La Dorada where Esso Colombiana, S. A., an Intercol affiliate, is building a small topping plant. In the Tetuan block, upper-Magdalena, two structures have been proved oil bearing, Tetuan proper where three wells have been completed and Ortega where the first test also made a strike, brought in for 323 b/d of 29.2° API oil. Tetuan No. 1 was brought in for 744 b/d of 23° API oil and No. 2 tested 236 b/d. Palobayo No. 1 test was abandoned at 3,062 feet. Tetuan No. 1 TD 4,579 feet, No. 2 TD 2,767 feet, and No. 3 suspended at 3,459 feet. Tetuan 4 is reported a good producer, is now testing and Ortega 2 is drilling at around 900 feet. These results are most encouraging for this block and the upper-Magdalena valley region.

Texas has signed up various concessions, one in the Llanos region as shown on the map. Besides the drilling going on in Tetuan and in Teran-G., Texas is now building a road to the well site in the Tasajero block, located just south of the 28,000 b/d Barco property, operated by Socony-Texas.

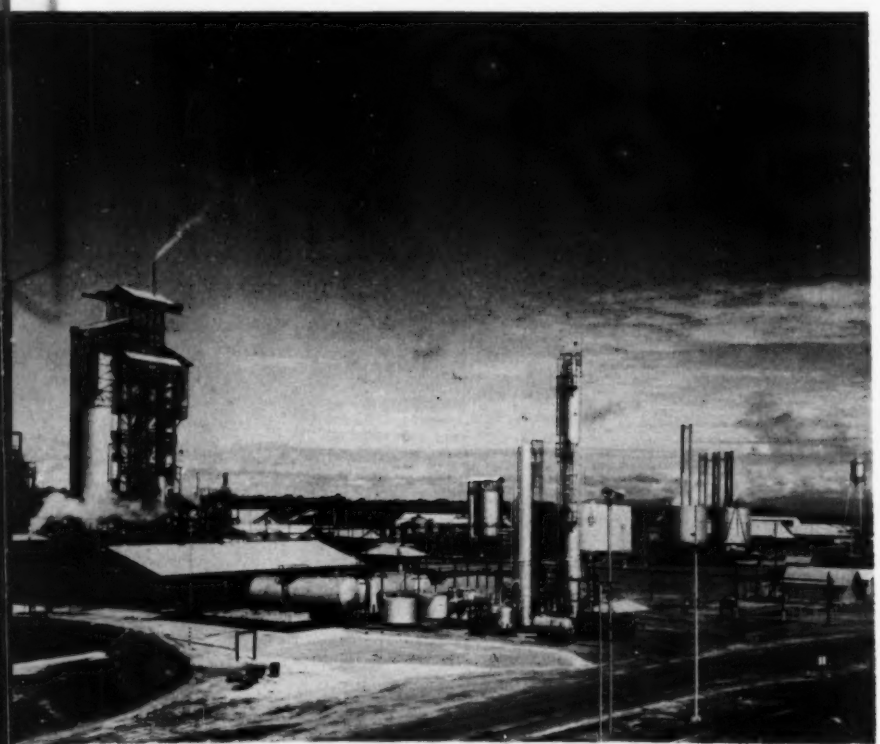
Richmond Petroleum Co., an affiliate of

Camp of the Socony-Vacuum Oil Company, Inc., at Cantagallo.

Standard of California, has renewed drilling activities and spudded Perico No. 1 on the Caribbean coast early in August. Richmond has also signed up the Oroco block shown on the map. Both of these are strategically located for oil production, when and if proved up.

In the Barco two fields are yielding the current 28,000 b/d, Petrolea where no drilling is taking place and the Tibu where several rigs are operating. A deep Cretaceous test is being drilled in the Rio de Oro field, reported close to 10,000 feet at present. Drilling is also taking place in the Sardinata structure and an important strike was made in North Sardinata No. 2 completed January 5, 1951 at 9,390 feet for 510 b/d of 55.6° API oil with a very favorable oil gas ratio. South Sardinata No. 2, now testing at 8,365 feet promises to be another strike. The No. 1 wells in both of these structures were drilled some time ago and the No. 2 wildcats have proven up the structures as oil bearing and promise to extend the Barco reserves considerably. During the first six months of 1951 seven wells have been completed, most of which are deep tests, as noted.

One independent, Guiberson of Dallas, Texas, is drilling in the Floresanto block, originally prospected by Socony, where a small field was discovered between 1942-47 during which time Socony completed 12 wells, two deep tests to 6,936 feet and 10,876 feet. The other ten range between 1,203 feet and 2,217 feet. Oil production of 50° API was obtained by Socony at 644 feet from Oligocene sand 35.7 feet thick. Some 100 acres were proved up and to 1947 a total of 11,000 barrels were produced and consumed as fuel in the concession. Guiberson obtained a new concession which covers around 37,500 acres and retained C. J. Simpson of Dallas as the drilling contractor. Two wells have been drilled; the first one was lost and the second, drilled to around 700 feet located on proved area, was brought in for about 50 b/d on the pump, flowing about three barrels per day of 54° API oil. A Bucyrus Erie spudder was used in this drilling and a medium-heavy rotary rig is going to be moved in.



Refinery at Barrancabermeja refinery which will be operated by Tropical, its former owner, under contract with Empresa Colombiana de Petroleos.

In the marketing of oil products Colombia is emerging from the drum distribution to the oil products pipe line stage. As may be seen from the map, one 87-mile oil products pipe line, between Pt. Salgar and Bogota, is under construction by Williams Brothers of Tulsa, good for 8,850 b/d. The difference in elevation for this 87-mile stretch is 640 feet-8,659 feet. This oil products pipe line will reduce the freight movement considerably, making such freight facilities available for other goods. The line also will assure Bogota an uninterrupted supply of oil products now frequently held up by landslides over the present narrow gauge railway. No. 2 oil products pipe line, built by Tropical from Barranca refinery to Pt. Berrio, passed over on August 25 to the official oil enterprise, Empresa Colombiana de Petroleos, and will continue operations. Nos. 3, 4 and 6 are being studied. No. 1 project to supply Medellin from Barranca directly is being built by the departmental government and a contract has been signed for its construction with a Houston firm, Caroline Construction Co. An application has been made in Washington for the steel needed.

The outstanding event of the year in the oil industry of Colombia took place on August 25 when Tropical Oil Co. officials formally transferred the De Mares concession and all the surface installation, equipment and inventory to the government, thereby fulfilling the contract obligations agreed upon when the grant was made on August 25, 1919. In view of the tense situation in Iran it is significant that the transfer or reversion of De Mares took place amid great festivities and the presence of over 150 guests of both International Petroleum Co. (Colombia) Ltd. and the new official oil enterprise, Empresa Colombiana de Petroleos who arrived by plane to attend the reversion ceremonies. The guests included high government officials and churchmen, army officials, outstanding businessmen, industrialists and the De Mares personnel of 2,800 employees and families who participated in the program.

The reversion of the De Mares concession is significant to Colombia as well as to the world oil industry because it is the first oil concession granted by a government, which has gone through all the industrial and legal processes provided in the concession contract, culminating with reversion of the properties to the government.

Besides the tangible benefits which have accrued both to the operator and to Colombia's

economy, there are a number of intangible benefits which cannot be appraised either in barrels of oil or revenues. Among these may be mentioned the opening up of Colombia's oil reserves which in turn attracted other oil operators; the experience which the government has obtained in promoting oil development and the knowledge Colombians have gained in all phases of the oil industry, as well as the training of the personnel which is now taking over and continuing De Mares oil operations; the improved standard of living for oil personnel and the great economic benefits to the country in having had since 1922 a domestic supply of oil products which developed commensurate to the economic and industrial development of the country.

In connection with the future of De Mares, the Empresa Colombiana de Petroles and International Petroleum Co. (Colombia) Ltd. have made two agreements. No. 1 covers the contract terms for operating the producing fields with Intercol as consultant and No. 2 with Intercol as operator of the Barranca refinery and future modern 35,000 b/d plant which is to be built. In general the terms of the two contracts are as follows:

Intercol will lend its consulting services to the Empresa, dealing with drilling and producing operations within a 37,000 hectare tract within De Mares, now productive. Intercol will furnish the following technicians and engineers: a general superintendent of producing operations; one assistant superintendent; five petroleum engineers; two producing operations directors; two natural gas plant operators; one chief geologist; three electricians; one mechanical and transport supervisor; one mechanical shop superintendent; two accountants; one materials and commissariat manager; two industrial relations men; a total of 22 technicians. Today De Mares producing operations have about 1,480 employees and about as many in the refinery.

All salaries, expenses direct or indirect and social benefits of Intercol's technical personnel will be paid by the Empresa and it is estimated will not exceed $25,000 monthly. To cover indirect expenses these have been estimated at 20 percent of the direct costs. No special consulting fee is paid to Intercol and as the consulting personnel diminishes, the outlay for these technical services will also be reduced. This agreement covers only De Mares oil producing operations and a separate one will deal with the proposed modernized Barranca refinery.

Through the personnel it hires, International will render the following services: (a) technical assistance and recommendations for the locating and drilling of new wells in the present producing fields and the Galan structure in the Magdalena River bed, (b) technical assistance on secondary recovery practices and oil production, (c) technical advice during the first year to organize the accounting department and control systems, (d) technical assistance for placing orders for materials necessary for the efficient operation of the oil fields, (e) consulting services and recommendations imply no responsibility for the results.

The agreement is valid for five years from August 25, 1951 when the Empresa took over De Mares and may be terminated after the first three years and modified with six months prior advice to Intercol. During the first three years the Empresa, at its discretion, may reduce the 22 member consulting staff of Intercol. The agreement guarantees full autonomy to Empresa in the management of the oil fields.

The second contract deals with the lease of the present Barranca 25,000 b/d refinery and the construction, financing and lease of the future refinery which is to have a 35,000 b/d throughput capacity and a 16,000 b/d catalytic cracking plant. The general terms of the contract provide: (1) the refinery contract is for ten years from the time the new plant goes on stream; (2) estimated cost of the new refinery is around $25,000,000 toward which Intercol has offered a loan of $10,000,000; (3) Empresa leases the present Barranca plant to Intercol and will sell crude oil to Intercol which will have complete autonomy in the management of the refinery; (4) Empresa will receive $254,800 annually (Ps 637,000) to amortize the present Barranca plant and $1,200,000 (Ps 3,000,000) when the new plant goes on stream, these sums representing amortization charges on a 20-year basis; (5) the lease of the refinery, present and future, will be on a barrel throughput basis; (6) Empresa will sell crude oil to Intercol based on West Texas crude oil process and when the new plant starts a premium of 29 cents per barrel will be paid to Empresa, representing around a 15 percent premium on world market prices; (7) the 35,000 b/d plant, it is estimated, will be able to meet practically all of Colombia's oil products demands up to 1960 and it will produce 100 octane aviation fuel; (8) F.O.B. Barranca refinery prices to buyers will be based on Gulf Coast for fuel products and New York for specialty products.

The Empresa Colombiana de Petroleos which is taking charge of De Mares, is a 100 percent official oil enterprise, created by Law 165 of 1948 and Decree No. 30 of January 9, 1951, and is an autonomous juridical person. It will engage in all phases of the oil industry. The Empresa will utilize preferentially its oil production to meet the country's oil demand. It is capitalized at Ps 100,000,000 ($40,000,000) of which Ps 500,000 ($20,000) are in cash and the balance is represented by the properties which the Empresa will acquire, particularly from the reversion of the De Mares 40,000 b/d producing property. The management will comprise: one manager, a three member board, an auditor and a secretary. Accounts will be rendered on June 30 and December 31 yearly. Of the net profits 10 percent will be assigned to an "exploration and drilling fund." After all charges are made the net profits will be paid over to the government. The Empresa may be converted into a corporation which will permit other oil companies and the public to subscribe shares, when and if the situation warrants it.

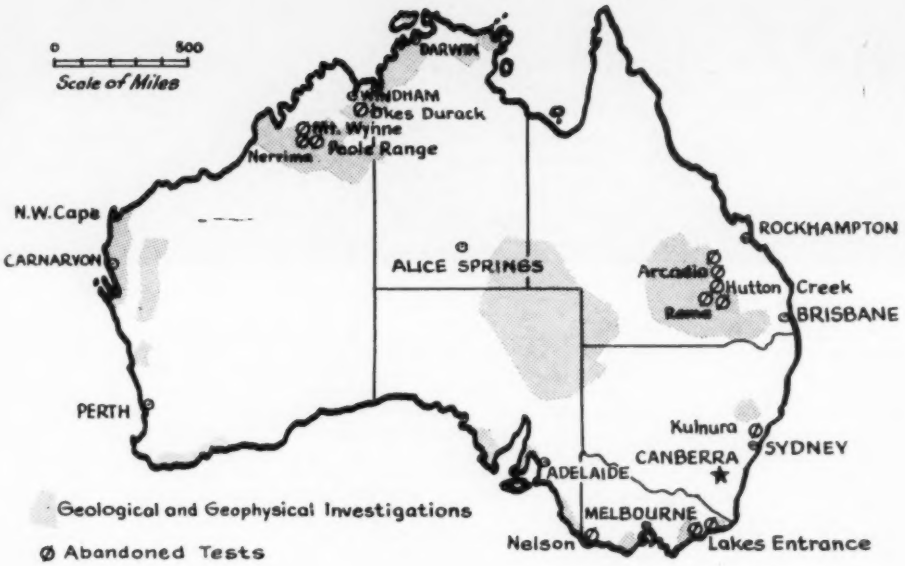
TABLE I

Oil Company Operations In Colombia

In U. S. Barrels—Year 1950—Ministry of Fomento Data

Operator and Producing Property	Area of Property-Acres	Oil Output Average 1950 B/D	Oil Output Average 1950 A.P.I.	Percentage of Output	Miles Inland	Total Wells Completed Dec. 31, 1950	Producing Wells Dec. 31, 1950	Total Personnel Dec. 31, 1950	Value of Oil Export-1950	Average F.O.B./B	1950 Royalties Paid Govt.
Tropical—De Mares	1,264,640	35 811	24.6°	38.4	335	1,373	1,019	2,800	$19,026,104	$2.22	$2,918,292
Shell—Yondo	118,091	26,495	20.5°	28.4	324	214	148	1,338	18,127,156	1.99	1,132,834
Socony-Texas—Barco	461,408	25,738	32.4° 46.6°	27.5	261	314	125	2,027	23,836,377	2.64	2,072,438
Shell—Deficil	119,963	2,993	42.3°	3.2	135	29	12	80	2,754,019	2.82	278,936
Socony—Cantagallo	52,364	1,197	21.1°	1.3	298	14	4	21	745,819	1.75	61,173
Texas—Teran-Gua.	402,259	1,079	27.1°	1.2	403	9	5	403			8,393
		93,313		100.0		1,953	1,313	6,669	$64,389,385	$2.28	$6,472,066

Runs to Stills: during 1950 to Barranca refinery ran an average of 25,361 b/d and the Barco topping plant 693 b/d.



Map showing areas in Australia where drilling and geological and geophysical work has been done. (After Arthur Wade, courtesy WALKABOUT, Australian geographical magazine.)

By Edgar Bee

The Search For Oil In Australia

NATURAL gas was encountered in drilling a water well in Australia in 1897. In the half century since that time millions of pounds have been spent in a search for oil but the continent still is without an oil field of significant importance. The few barrels produced from the Lake Entrance field in Victoria are inconsequential in an expanding modern economy such as is developing in Australia. Since 1939 oil demand has doubled on the continent reaching about 39.5 million barrels daily in 1950. Consumption last year was more than seven million barrels greater than in 1949.

Despite the many disappointments of past years the search for oil has not been abandoned either on the continent or in the Papua-New Guinea territory. The drilling of 467,000 feet in some 270 tests in the past 20 years has cost the oil companies and the Australian government some £11 million and yielded only traces of oil. The search has condemned some areas but there are still vast regions yet to be drilled.

Most aggressive wildcatting project in the commonwealth now, as it has been since the war, is being conducted by Australasian Petroleum Co. Pty Ltd. (Anglo-Iranian Oil Co., Socony-Vacuum Oil Co. and Oil Search Ltd.). On the continent itself Shell has recently suffered another disappointment in Queensland but California-Texas Oil Co. and the Ampol Co. are studying the west coast where Ampol has oil-search permits covering some 250,000 square miles.

During the first 30 years of the twentieth century Australian mining laws did not encourage the risk involved in searching for oil. In the early 30's, however, there was a change in government policy and, as a result, several of the large oil companies undertook extensive exploration. Shell interests undertook to explore Queensland and Caltex began work in the West Kimberley district. Socony-Vacuum and Anglo-Iranian teamed up with the Line Corp. to explore central Australia, the northern territory and the northern part of Western Australia. Socony-Vacuum and D'Arcy (Anglo-Iranian) worked with Oil Search, Ltd. in central parts of the territory as well as in Papua and New Guinea.

The federal Bureau of Mineral Resources, Geology and Geophysics has engaged in extensive mapping which has revealed a lot of new information. The bureau has about 20 geologists and 10 geophysicists engaged in oil search. Basic technique is aerial photographs from which maps can be made. Guided by these, teams of geologists systematically map the area, determine the thickness and character of beds which might be oil-bearing, determine the suitability or otherwise of the structures and other factors which might have a bearing on the presence of petroleum.

Private organizations which have been doing similar work recently are the Australasian Petroleum Co. Pty Ltd. and Island Exploration Co. Pty Ltd., in Papua, and Shell (Queensland) Development Co. which has been carrying out a mapping and drilling program in Queensland.

Recently the Federal bureau has been centering its search in northwest Australia, where it has about ten geologists at work along with technical staff. Over the past four or five seasons the bureau has had a number of parties in the field, which have done much detailed work, though some remains to be done. It is only in the past few years that much has been known about the geology of these areas. The bureau has also had seismic crews working in Queensland.

In Queensland the Shell (Queensland) Development Co. carried out a very thorough mapping program, and began drilling a test oil well at Morella, north of Rome, early in 1950. This was abandoned early in 1951, basement rocks having been encountered, according to reports, at a considerably shallower depth than was anticipated. So far, no plans have been announced for further test wells.

Some work is currently being done in Queensland by the Roma Blocks Oil Co., for which the bureau has done seismic work. For years past the Roma area has been the scene of intermittent oil search. Behind the bar of one of the hotels is a considerable array of cores and other specimens from past drilling activities by a number of companies. It is understood that the Roma Block Co., in conjunction with Roma No. 1 and Roma No. 2 and others, plans to drill again soon.

John Royle, of J. Mac D. Royle Pty Ltd., Sydney, has formed a syndicate known as Kelso Oil, which has obtained rights over 200 square miles in the Longreach area of Queensland, where both the Bureau of Mineral Resources and the Queensland Geological Survey Department have consented to investigate potentialities. If the bureau decides that a geophysical survey is warranted, and this shows sufficient promise, the syndicate aims to raise £100,000 for drilling.

About 1920 Mr. Royle was drilling a second artesian bore to augment the town of Longreach's water supply when at a depth of 3,200

feet an oil horizon was encountered in close proximity to the artesian water. There was so much oil in this water that a plant had to be put in to separate the oil before the water could be used for town purposes. In 1928, Mr. Royle and his brother drilled a well near this site, hoping to strike the same horizon and to shut off the water. The oil horizon was encountered and yielded about 30 parts to 200,000 parts water. Attempts to cement off the water resulted in the oil being shut off also. Later attempts to recondition the well were abandoned with the advent of the financial depression. Mr. Royle claims to have been the first man in Australia to have really "struck oil," and he has great faith in Queensland as an oil-producing state. He says that traces of oil and gas have been encountered in hundreds of artesian bores in that state.

In South Australia, the Frome-Broken Hill Co. controlled by the Zinc Corp. Ltd., has been drilling in the Lake Frome area, mainly for natural gas.

Focus of interest in the search for oil appears to have been shifting, however, towards the North-West Basin and Kimberley regions of Western Australia. Over past years many geologists have worked in these regions, but in the earlier years the work was fairly sketchy, in the nature of reconnaissance. From this stage gradually various parties have proceeded to more detailed surveys. In 1939 and 1940 Carl Bremner, a senior geologist employed by the Caltex interests, made an extensive survey of the North-West Basin area and compiled reports which were subsequently made available to the Commonwealth Bureau of Mineral Resources. More recently (since 1948) Ampol Petroleum Ltd., an independent, entirely Australian company, has been active in the North-West Basin and in 1950 carried out a fairly detailed survey of Dampier Land, an inhospitable country of pindan scrub between Derby, Broome, and Cape Leveque. However, the bureau has done most of the more detailed geological work in the Kimberleys and North-West Basin.

Apart from some small area, the rights for which are held by the Freney Kimberley Oil Co. (1932) N.L., all oil exploration rights in Western Australia are held by Ampol, which company has oil-search permits over some 250,000 square miles of the state, including the Kimberleys, North-West Basin, which extends roughly from Carnarvon to Onslow, and strips down the coast to the Cape Leeuwin area in the extreme south-west.

The Freney company has been operating for many years, intermittently, with some assistance from both Federal and Western Australian governments. It is reported that the company is about to acquire further equipment and redrill a well at Nerrima, on which drilling had to be suspended during the war years. The company met many difficulties in trying to clean this well after the war. The Freney company has been down to about 4,000 feet and in Western Australia there has been no drilling below that level; hence no certain knowledge.

Among experts who have examined and been impressed by the oil-bearing possibilities of the North-West Basin is Eric K. Craig, U. S. consulting geologist, who visited the area at the end of 1948 and spent six months there on behalf of Ampol. Mr. Craig emphasized particularly the oil-bearing possibilities of Rough Range, a chain of low hills running parallel to Exmouth Gulf and about four miles inland. He stated that surface and sub-surface rock formations there have many points in common with oil fields of California and that conditions suitable for the accumulations of petroleum are present. He added that the Rough Range and Cape Range anticlines, in their near symmetry and absence of faulting, approached "text book structures."

Other experts who have visited the Exmouth Gulf area have said that if the geological structures there had been in Texas they would have been drilled 25 years ago.

Consulting geologist Hampton Smith stated in a report (Jan. 1951) that there was a "very good chance that oil and gas will be discovered in either the Desert Basin or the North-West Basin. Moreover, if oil is discovered there is a good chance that it may be present in such tremendous quantities as to make Western Australia one of the major provinces of the world. However, there are a number of important geological uncertainties . . . many of which can only be solved by drilling . . ."

This year the Bureau of Mineral Resources is sending a seismic team to the North-West Basin area, and the Ampol-Caltex interests are maintaining an advance party at Learmouth to prepare for possible drilling operations.

About the middle of 1950 negotiations began between Ampol Petroleum Ltd. and Caltex regarding the possibility of Caltex participation in further developmental work. Toward the end of the year four senior Caltex geologists spent more than two months in the Kimberleys and North-West Basin area further examining the area. As a result of their report, R. G. Follis, chairman of Standard Oil Co. of California and A. C. Long, executive vice president of The Texas Co., with T. L. Lenzen, R. W. Miller, P. Piggott and E. M. Butterworth, visited Australia in March 1951 to form first-hand impressions of conditions.

It has now been announced that, subject to the realization of certain conditions and requirements, Caltex has agreeed to join Ampol in this venture. It is possible that drilling of the first test well in the North-West Basin will be started soon. It is estimated that this work will cost up to £1,500,000.

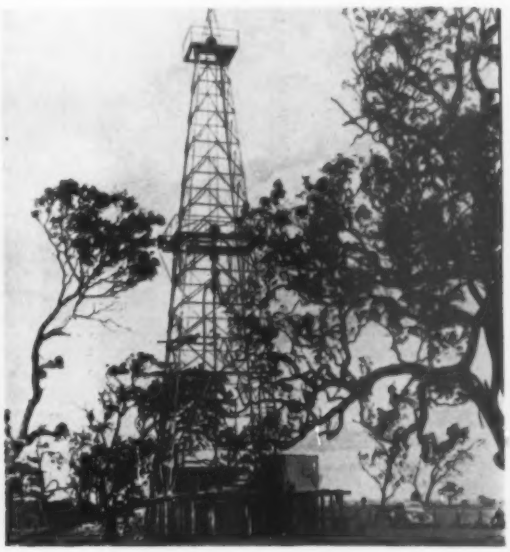
There are many problems still to be solved; for instance, the transport of some thousands of tons of machinery and equipment. In this barren-looking spinifex country of a few scattered sheep-station homesteads there are practically no roads. The overland haul from Perth, the state's capital, is 870 miles and some of the transport will have to be done by air.

A number of practical oil-field operators are expected to visit the area very soon to study these and other problems associated with the enterprise.

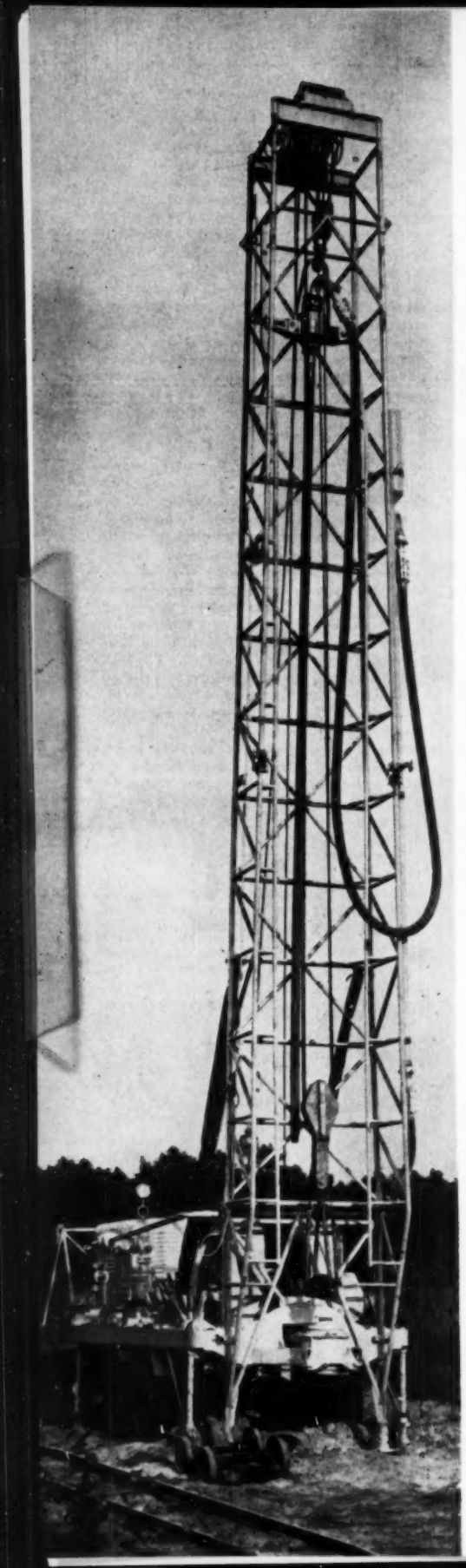
Soon it is expected the test will begin. Meanwhile, R. G. Casey, minister for national development, pointed out recently, "So much is at stake in the search for oil in Australia that we cannot afford to be discouraged by our lack of success so far . . .

"Our dependence, in peace and in war, on a long and vulnerable tanker life-line is clear, and is a dangerous chink in our armor. Discovery of a single oil field would have profound effects, strategic, economic and social, on Australia's future."

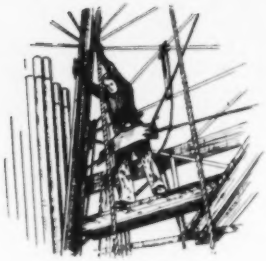
Wildcat rig drilling near Lake's Entrance, East Gippsland, Victoria. Australian official photo. ▶



With imports in excess of 30 million barrels yearly Australia has developed large marine terminals such as the H. C. Sleigh, Ltd., plant at Melbourne. Photo courtesy Australian News and Information Bureau. ▼



Portable rig for drilling core holes to 2,000 feet.



German Oil Industry On the Upgrade

By A. M. Stahmer

THE upward trend of German crude oil production which has been maintained since 1948 has continued in recent months. In May a new monthly record was reached with a yield of 112,470 tons (810,000 barrels) 46.4 percent of which fell to the share of the Hanover province, 43.9 percent to Emsland, 9.2 percent to Schleswig-Holstein and Hamburg, and the small remainder of 0.5 percent to Baden in southern Germany.

As this percentage shows, the Hanover province, which had been surpassed by Emsland in 1950, has regained the top position. This is due to the fact that at least two, probably three major (according to European standards) new fields were discovered in Hanover in 1949 (Suderbruch and Eldingen) and to these Hohne was added in January 1951. An interesting point about these new Hanoverian fields is the fact that they represent a geological type previously unknown in northwest Germany. Unlike other fields in the Hanover area, they are not bound to salt domes, but to deep intermediate structures. Further exploration has shown that horizons of Liassic and Rhaetic (Triassic) age are more promising than they had been considered before.

Nevertheless, Emsland, with the prosperous new field group of Ruehlertwist-Ruehlermoor, discovered in 1949, still holds first place on the reserve list. In April last the German Geological Survey published a revised estimate as of January 1, 1951, which shows 25,850,000 tons of proved and probable reserves for Emsland, 10,150,000 tons for Hanover, 1,960,000 tons for Holstein-Hamburg, and 65,000 tons for Baden. The total of 38,025,000 tons for the whole of western Germany is 1.5 million tons higher than the previous calculation issued a year ago. As 1.1 million tons crude were produced in 1950, the real surplus amounted to 2.6 million tons.

The Wirtschaftsverband Erdoelgewinnung (association of crude producers) has published its yearly report with particulars about the activity and the structure of the German crude producing industry. The crude output of 1950, which was 33 percent higher than that of the preceding year, originated from 39 fields, which are geographically and geologically separated from each other. The gain came mainly from the new fields developed in 1949. Production of some older pools such as Steimbke and Wesendorf increased while the output of the two biggest German fields, Georgsdorf and Emlichheim (Emsland), which reached a peak at the beginning of 1950, was later reduced to preserve reservoir pressure.

Four new fields were discovered in 1950 and at the beginning of 1951, namely Quakenbrueck, Wathlingen, Edesse-Nord and Hohne, the geological conditions of which were previously described in WORLD PETROLEUM. In the meantime two new oil horizons were explored in the promising Suderbruch field which is owned jointly by Deutsche Vacuum Oel AG (Socony-Vacuum) and Gewerkschaft Brigitta, an affiliate of Esso and Shell. In December 1950 the well Suderbruch 8 came in at a depth of 3,842 to 3,862 feet in the Upper Valendis (Cretaceous) with an initial daily yield of 230-250 barrels through a quarter-inch choke, the specific gravity being 0.891. In June 1951 a further oil bearing horizon was discovered in the Gigas beds of the Malm.

The German crude output of 1950 originated from 1,891 producing wells, which averaged a yield of 579 tons yearly or 1.6 tons daily respectively. Table II shows the production of the various companies in 1950 and the drilling record of these firms. The list shows that production is scattered among more than twenty companies including about a dozen that have an output of less than 1,000 tons per year.

German built cantilever rig drilling in the Quakenbrueck field.

Of the footage drilled which was 28.1 percent above that of the previous year, 735,897 feet was in known fields, 215,491 in extensions and 305,075 in wildcats. It was achieved by 103 rotary rigs, while 60 other outfits sunk 96,443 feet in core holes. Of the 419 wells completed, 240 came in as producers. Of 66 extension wells 24 were productive, and of 58 wildcats only three had a positive result.

Some noteworthy features of the year's drilling campaign may be noted. Rodewald WA 400 of Gewerkschaft Brigitta with a total depth of 12,632 feet was the deepest hole thus far drilled in Germany.

The first offshore test was drilled off the North Sea coast by Deutsche Erdoel AG., and a program of multiple directional drilling in the moor area of Ruehlertwist was started by Wintershall AG. under supervision of H. J. Eastman. The deviation of the wells is about 650 feet. A program of 438 completed wells with a total depth of 1,606,000 feet is planned for the current year. In the first five months of 1951 the footage amounted to 501,927 feet.

During the past year 26 geophysical crews conducted 102 explorations. Of these, 24 parties were active in areas outside northwest Germany. Several new structures were outlined in the Muenster basin (Westphalia), Baden and Bavair, which will be objects of future drilling. In 1950 the German oil industry received 1.5 million dollars from ECA funds for its operations. For this sum complete rigs, accessories, roller bits, seismic outfits and other equipment were imported from the United States.

At present Western Germany obtains about one third of its total crude requirement from domestic sources. The producing companies hope to maintain this ratio by increasing their output steadily.

Since the first report on the coordination of oil refinery expansion in the OEEC countries in 1949 fixed a figure of 5.3 million tons crude intake capacity in the fiscal year 1952-53 for Western Germany, conditions have changed in many ways. The objective of the Marshall Plan was that Germany, like the other European countries, was to become, as far as possible, independent of imports of finished products by building up a refining capacity commensurate to demand, so that imports would be limited mainly to crude. As a matter of fact, the economic recovery in the Federal Republic after the currency reform proceeded more rapidly than could have been anticipated. The increasing industrial production, the sharp rise in the number of motor cars in use and the gradual lifting of restrictions on gasoline caused a growing consumption of mineral oil products exceeding former estimates. Consequently the plan figures were revised and, at the last session of the OEEC-Oil Committee in Paris, an over-all demand of 5,814,000 tons mineral oil products plus 600,000 tons bunker oil was quoted for the last Marshall Plan year 1952-53, against 4,173,000 tons which had been scheduled in the first report for the same year. The new figures comprise 2,100,000 tons gasoline, 1,725,000 tons gas oil, 600,000 tons fuel oil and 400,000 tons lubricants.

This new estimate justified an increase of refining capacity for which several applications were at hand. After thorough examination of the German proposals a new figure of 6,340,000 tons crude intake capacity was accepted by the OEEC at Paris. This excludes the project of Gewerkschaft Erdoel-Raffinerie Emsland, a joint company of German crude oil producers, for the erection of a plant of 500,000 tons annual capacity with catalytic cracking facilities, near Lingen (Emsland), and for an additional crude intake capacity of 700,000 tons yearly, resulting from the extension of the Esso plant at Hamburg-Harburg because both these projects will not come into operation before late 1953, after the end of the Marshall Plan.

The various changes applied to the new refinery expansion program may be briefly described as follows: The Shell refinery at Hamburg-Harburg will have an annual capacity of 490,000 tons in 1952-53 instead of 320,000 tons as authorized before. The old figure for the Shell plant at Monheim (on Rhine) is increased by 20,000 tons to 200,000 tons yearly; the capacity of Deutsche Gasolin AG., Dollbergen, from 90,000 to 117,000 tons yearly; Deurag-Nerag, Misburg, from 424,000 tons to 465,000 tons; Deutsche Vacuum, Bremen-Oslebschausen, from 520,000 to 540,000 tons; Deutsche Erdoel-AG., Heide and Wietze, from 384,000 to 480,000 tons and Union Rheinische Braunkohlen Kraftstoff AG., Wesseling, from 650,000 to 800,000 tons. On the other hand Lingen and Ernst Jung, Hamburg, which were listed in the last report with 600,000 and 250,000 tons yearly respectively do not appear on the new list, Jung because the project has been incorporated in the building plan of Ruhrchemie, and Lingen because it will be completed after the end of the Marshall Plan. For the latter reason also the figure for Esso Harburg (formerly 1,180,000 tons) was reduced to 705,000 tons.

Eight new projects are now included in the official OEEC list, the capacities of which are already available or will be by the end of the Marshall Plan. One of the most important of these plants is that of Gelsenberg Benzin AG. at Gelsenkirchen. As may be remembered the hydrogenation works of Gelsenberg were the object of a dismantling order of the Allied authorities. The German industry pleaded for the inclusion of Gelsenberg, which was not heavily damaged during the war and could be restored at relatively low cost, in the oil processing program. This matter was still pending when the first OEEC report was published. At the beginning of 1950 the debate was decided finally in favor of the plant. Since then, Gelsenberg, which by a supply contract is bound up with Deutsche Vacuum Oel AG. (Socony-Vacuum) and Esso AG. is, like its sister plant at Wesseling near Cologne, topping and hydrogenating German and foreign crudes. Gelsenberg as well as Wesseling will improve its efficiency by erecting catalytic (Gelsenberg) or thermal (Wesseling) cracking units of 400,000 and 325,000 tons annual capacity respectively. After addition of these units the through-

TABLE I

Crude Oil Reserves—January 1, 1951
In Thousands of Metric Tons

	Proven	Probable	Total
Emsland	18,900	6,950	25,850
Hanover	7,420	2,730	10,150
Hamburg-Holstein	1,120	840	1,960
Baden	45	20	65
	27,485	10,540	38,025

TABLE II

Production and Drilling Footage in 1950

Company	Tons	Footage
Wintershall AG.	259,162	263,349
Gewerkschaft Elwerath	231,882	244,200
Deutsche Erdoel-AG.	146,184	163,582
Deutsche Vacuum Oel AG. (and Gewerkschaft Siegfried)	127,428	113,587
Gewerkschaft Brigitta (Esso & Shell)	111,658	177,442
Preussag	108,387	112,396
C. Deilmann Bergbau GmbH.	64,503	81,811
Deutsche Schachtbau- & Tiefbohr-GmbH.	52,601	60,617
H.v.Rautenkranz Itag	7,674	26,385
Braunschweigische Bohrgesellschaft	6,343	6,995
Erz- & Erdoelhandelsgesellschaft	663	—
Georg Greiser	355	3,327
Ferdinand Koller & Son	255	1,601
Gewerkschaft Brunhilde	250	—
Gewerkschaft Walter Ritter	245	—
Gewerkschaft Sidonie	237	—
Gewerkschaft Margaretha	178	—
E. B. Espey	136	—
Gebruder Pralle	118	—
Others	356	1,171
	1,118,616	1,256,463

put will be handled in three stages: first topping, second cracking, and third hydrogenation. In this way most of the output will consist of light products such as gasoline, diesel oil and liquefied gas and the relatively expensive hydrogenation process will be confined to the cracking of residues.

A third hydrogenation plant, Scholven Chemie AG. at Gelsenkirchen-Buer, has been included in the OEEC program with a yearly crude intake capacity of 400,000 tons. Scholven, which was partly destroyed by bombing during the war, has started rebuilding and may be ready to take up hydrogenation by the beginning of next year. During the war, the plant produced isoctane gasoline by coal liquefaction. It belongs to Hibernia, a state-owned sister company of the German crude producing firm Preussag.

Forty percent of the future crude supply of Scholven probably will come from the Emsland oil fields of Preussag, while the remainder will be delivered under agreement with BP Benzin and Petroleum-GmbH. (Anglo-Iranian). Scholven intends to erect a catalytic cracking unit, and its hydrogenation will run parallel with cracking. The heaviest residues from the top process will immediately be hydrogenated, while the lighter paraffineous residues will be cracked. A rerunning system will guarantee the fullest possible utilization of both these processes.

Another new refinery in the Ruhr district, which probably will come into operation at the beginning of 1952 with a crude intake capacity of 250,000 tons per year and a thermal cracking capacity of 125,000 tons per year, is that of Ruhrchemie AG. in Ober-

Adding top half to a 170-foot benzine tower at the Esso AG refinery at Hamburg-Harburg.

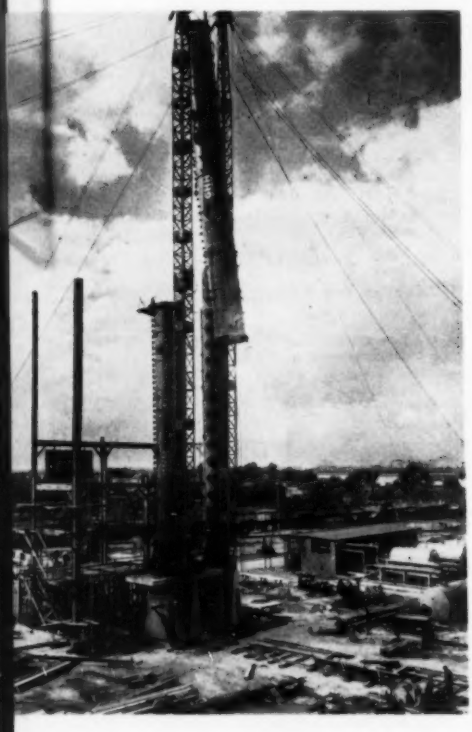


TABLE III

Crude Intake Capacity of Oil Refineries In Metric Tons

Company	Location	1951	1952/53
Badische Anilin- & Sodafabrik	Ludwigshafen/Rhine	48,000	48,000
BP Benzin- & Petroleum-GmbH. (Anglo-Iranian)	Hamburg-Finkenwerder	600,000	600,000
Deutsche Erdoel-AG.	Heide and Wietze	145,000	480,000
Deutsche Gasolin-AG.	Dollbergen	105,000	117,000
Deutsche Shell AG.	Hamburg-Harburg	490,000	490,000
Deutsche Shell AG.	Monheim	200,000	200,000
Union Rheinische Braunkohlen Kraftstoff AG.	Wesseling	800,000	800,000
Deutsche Vacuum Oel AG. (Socony-Vacuum)	Bremen-Oslebshausen	540,000	540,000
Esso AG.	Hamburg-Harburg	660,000	705,000
Gelsenberg Benzin AG.	Gelsenkirchen	720,000	750,000
Gewerkschaft Deurag-Nerag	Misburg	465,000	465,000
Georg Greiser	Dollbergen	6,000	—
Kraftstoff-Handelsgesellschaft (Schieweck Bros.)	Essen-Altenessen	—	35,000
Mineraloel- und Asphaltwerke AG.	Ostermoor	60,000	60,000
Mineraloelwerke Albert Sengewald	Dedenhausen	24,000	—
Oelwerke Julius Schindler GmbH.	Hamburg-Neuhof	120,000	240,000
Mineraloelwerke Peine	Peine	18,000	—
Ruhrbau GmbH.	Muelheim on Ruhe	—	100,000
Ruhrchemie AG.	Oberhausen-Holten	—	250,000
Scholven Chemie AG.	Gelsenkirchen-Buer	—	400,000
Wintershall AG.	Salzbergen (Emsland)	60,000	60,000
Zeller & Gmelin	Eislingen/Fils	80,000	—
		5,069,000	6,340,000

hausen-Holten. The plant is a part of the well-known Fischer-Tropsch synthesis works of Ruhrchemie which is now being rebuilt. Koch Engineering Company supplies the technical advice on the erection of the thermal cracking facilities and an additional reforming unit at Oberhausen. Ruhrchemie has an agreement with a German affiliate of Omnium Francais de Petroles which is to deliver foreign (Arabian) crude. During the past month a part of the refinery began topping on a small scale.

In Hamburg-Wilhelmsburg the Oelwerke Julius Schindler GmbH. has erected a topping unit with an intake capacity of 240,000 tons crude per year which has been in operation for some time.

At the beginning of May a new plant of the Ruhrbau GmbH., which is jointly owned by Braunkohlen Benzin AG. (Brabag) and Hugo Stinnes, was put on stream, topping Arabian crude at the rate of 100,000 tons per year. For this refinery some units of the abandoned shale oil plant at Balingen (Wuerttemberg) were moved to Muelheim for re-erection.

Three smaller refineries now are included in the official OEEC plan. These are the bitumen works of Mineraloel & Asphaltwerke AG. (Mawag), Ostermoor on the Kiel Canal, with 60,000 tons Venezuelan crude intake annually; the plant of Badische Anilin & Soda-Fabrik, Ludwigshafen on Rhine, with 48,000 tons crude intake per year and the new plant of Kraftstoff - Handelsgesellschaft (Schieweck Bros.) at Essen-Altenessen with a throughput of 35,000 tons yearly.

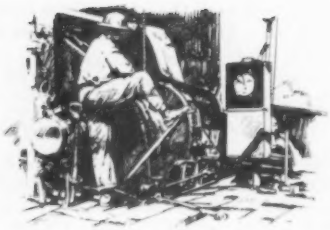
In the total crude treating capacity of 6,340,000 tons envisaged for Western Germany for the fiscal year 1952/53, 1,400,000 tons of catalytic cracking, and 970,000 tons thermal cracking capacity annually are included, besides 760,000 tons of hydrogenation capacity. The new cracking units are of American design and will be installed under the supervision of American engineering firms.

Altogether 1,113,462 tons of German crude were delivered to the refineries in 1950. In the same year 2,226,702 tons of foreign crude oil were imported, of which 82.4 percent came from Middle East, the rest from Venezuela. Heading the list of import countries is Iraq with 850,809 tons. The second place is taken by Saudi Arabia with 721,758 tons, followed by Venezuela, Kuwait, Qatar and Iran. While the curve of crude oil imports shows a steep rise from 39,407 tons in 1947 to 2.2 million tons in 1950, deliveries of finished products decreased from 1.2 million tons in 1948 to 891,468 tons in 1950, the bulk of the latter amount being gas oil (642,616 tons). Refinery production increased from 624,500 tons in 1947 to 3.2 million tons in 1950. The first quarter of 1951 brought a further improvement with a total output of slightly over one million tons.

Output of Refineries in the First Quarter 1951

	In Metric Tons
Liquid gas	14,102
Motor gasoline	316,210
Special benzine	33,838
	364,150
Lamp kerosine	10,586
Motor kerosine	2,199
	12,785
Diesel oil	210,877
Lubricants	106,869
Bitumen	89,018
Fuel Oil	177,809
Other products	53,168
	637,741
	1,014,676

While oil consumption in the Federal Republic has expanded to a larger extent than was expected earlier, the rate of increase has slowed down since the beginning of 1951 when a new mineral oil tax was passed. Moreover, the Federal Minister of Finances decreed new fixed duty rates for crude as from July 1, without the refining preferences which were granted before. As a result the price for gasoline ex pump, which was DM 0.55 on January 1, 1951, rose to DM 0.63-DM 0.68 on April 1 (according to freight zones) and to DM 0.66-DM 0.71 per litre on July 5 (15.7 and 17 United States cents). A new system of taxes and duties proposed by the petroleum industry has been accepted in principle by the Ministry of Finances and may come into effect before the end of this year. In that case prices probably can be reduced again and consumption will develop in a normal way according to the general recovery of German economic life.



Trinidad Turns To Deeper Drilling To Maintain Reserves And Production

By June Chatfield

DRILLING activity in Trinidad this year is at a new high. At the end of June, 26 rigs were being operated as compared with 25 in 1950 and 24 the previous year. Twenty are employed in the constant race to maintain production at recent rates above 56,000 barrels daily and six are seeking new oil in deeper horizons. Since the war Trinidad has dropped from first place to third among producing areas within the British Empire, being passed first by Borneo and more recently by Canada. Unless deeper production is obtained on the island, it will be difficult if not impossible for Trinidad to increase its output much beyond its present level.

The year 1950 also was a busy one in Trinidad with much time and money being spent on deep drilling. Two wells passed the previous year's depth record (12,161 feet), Trinidad Leaseholds, Ltd. drilling to 12,604 feet and Trinidad Petroleum Development Co., Ltd. to 13,471 feet. The deepest producing well (Trinidad Leaseholds) thus far is 10,500 feet. Altogether the expenditure on deep drilling in 1950 amounted to almost eight million dollars or more than double the average annual amount similarly spent in the preceding five years.

By far the greatest volume of oil in Trinidad still comes from the Miocene sands, but all companies are looking for oil in the Cretaceous. Trinidad conditions present very definite problems, however. The stratigraphic conditions of the island are noted for their

Part of the United British Oilfields refinery at Point Fortin. A Shell photograph.

complexity. It is exceedingly difficult, if not impossible, to forecast conditions at depth. Surface indications do not help and even the use of the seismograph has not been altogether successful. The general geological sequence has been worked out somewhat by detailed geological mapping and the free exchange of well data between companies, but every new well is still something of a wildcat. Of 14 deep wells recently drilled, only one has been a success.

Sediments of the Cretaceous age are already productive in Venezuela, but "a most guarded view must be taken of the Cretaceous prospects in Trinidad," stresses P. E. T. O'Connor, general manager of Antilles Petroleum Co. and manager of the Petroleum Association of Trinidad. "It is true," he said, "that the combined production from two of the best wells in the Lake Maracaibo area of Venezuela could be as great if not greater than the whole production of Trinidad; and San Fernando Hill (in Trinidad) is composed of Upper Cretaceous rocks; but it is only the Upper or Top Cretaceous and so far no well in Trinidad has penetrated anything below this Top Cretaceous."

The highly productive Cretaceous wells in Venezuela produce from the Middle Cretaceous period, and Trinidad is handicapped by the great depth at which the Cretaceous lies in many structures. A well drilled to over 12,000 feet in Southern Trinidad never reached the Cretaceous. Wells which have reached the period so far have given only salt water, a little tarry oil and a little gas. However, there may be a great deal of oil in the Cretaceous horizon, which would justify the considerable expense of drilling. There is hope, at any rate, and the drilling must be done. By no means have all the possible reservoirs been tested.

Future marine drilling in the Gulf of Paria will depend to a considerable extent on the present search being made for new reservoirs on land. The preliminary capital expenditure to provide the necessary drilling platform and ancillary works to commence an offshore well is over $500,000 greater than for commencing a land well.

The boundary between Trinidad and Venezuela in the Gulf of Paria was settled by treaty between Great Britain and Venezuela on Sept. 22, 1942, and leases for drilling in submerged areas are now being assigned. The submerged areas are to a large extent unprospected thus far. Geophysical surveys have been made over parts of the sea, but they haven't provided much information. Geophysical work from a diving bell is unsatisfactory because the sea bottom is covered with thick mud. It has been possible, however, to make observations of minute differences of gravity from place to place and attempts have been made to tie these in with similar observations on land.

Kern Trinidad Oilfields, Ltd. recently began obtaining production from a 3,300 foot offshore well. This is a directionally drilled well, an extension of the company's existing onshore Guapo field rather than a marine field discovery. Offshore drilling in the immediate future probably will be confined to such directionally drilled wells.

During 1950 the Trinidad oil industry maintained production at the level of the previous year. Production of crude oil for the past four years and footage drilled have been as follows:

Year	Barrels Crude Produced		Footage Drilled
	Total	Daily Average	
1950	20,632,421	56,527	659,565
1949	20,616,721	56,484	630,209
1948	20,017,454	54,938	638,681
1947	20,443,164	55,981	644,689

In 1950 a total of 149 wells were commenced, including six wildcat wells, and 136 wells were completed as producers. The only wildcat well to find producing sands in a new area was United British Oilfields of Trinidad's well at Catskill Reserve. Production is kept up by drilling within known fields and extending them little by little. Whereas wells used to be spaced 1,200 feet on the average, they are now 600 feet apart. In 1940 wells averaged a depth of 3,700 feet, in 1946, 4,800 feet, and today an average of more than 5,000 feet with some going to 10 and 12,000 feet. The cost of an exploratory well has risen in recent years from $100,000/$200,000 to $500,000/$1,000,000.

In general an operator in Trinidad can expect from a proven area an average ultimate production of 100,000 barrels a well There are just over 2,000 producing wells in Trinidad, and the average production per well is less than 30 B/D. Two-thirds of these wells are on artificial lift, since pressure declines quickly. Trinidad Leaseholds and Apex (Trinidad) Oilfields, Ltd. are using some secondary recovery. Repressuring was started by Apex at Fyzabad in February 1950.

The proved crude oil reserves of Trinidad have been judged to be around 300 million barrels, or almost the equivalent of the island's cumulative production from 1907 through 1947. The greatest production comes from Miocene horizons in the Forest Reserve, Apex Parry Lands, Perseverance and Palo Seco fields. Some oil has been produced from the Oligocene and Eocene horizons. The discovery of oil-producing Herrera sands in the Penal field in 1938 and a deep development of the same sands at 9,000 feet in 1946 raised hope for oil in the Oligocene horizons, but the highly complicated subsurface construction makes exploration difficult. All the same, the Herrera sands probably represent the best immediate exploration prospects in Trinidad, with the Cretaceous exploration also a prime objective. During the war Trinidad had to tap its most prolific horizons and shut down all wildcatting work. Thus there is a backlog of testing data and all indications are that the present tempo of exploratory drilling will be maintained.

Trinidad drilling conditions present difficulties. The high rock pressures at shallow depths; the widely different pressures in oil, gas and water reservoirs; and heaving and swelling shale all create obstacles. Use of a new mud technique has helped to combat these problems however. Muds from starch, from silica gel and from asphaltic base oil have all been used and have made drilling to greater depths possible.

Refining facilities were expanded during

the war in order to meet the demands of Allied ships and planes operating in the Trinidad area. At the end of the war the industry had more processing capacity than was required by domestic production. To meet this situation crude oil is today imported from Venezuela and Colombia. The present refining capacity is over 100,000 B/D, Trinidad Leaseholds refinery at Pointe-a-Pierre has a throughput capacity of 70,000 B/D (35,000 B/D cracking capacity). United British Oilfields refinery at Point Fortin has a maximum throughput capacity of 30,000 B/D. In addition Brighton Terminal Ltd. has a capacity of 4,000 B/D. The Brighton topping plant was completed this year, its equipment consisting of a 3,000 B/D main fractionator acquired from the old Kern plant and modified, a flash tower, and a new 5,000 B/D furnace.

At Trinidad Leaseholds' refinery a dozen large new tanks have been built. They are 55 feet high and hold 150,000 barrels. The sulfur recovery plant is now processing eight tons a day, and the old furfural plant is being used to make detergents.

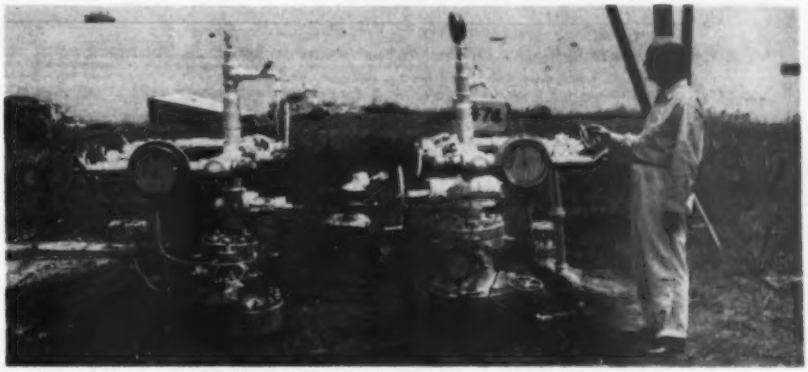
The largest construction project on the horizon is Trinidad Leaseholds' fluid catalyst cracking plant, for which the foundation is being poured. This will be a $20 million plant with a capacity of 15,000 B/D and should be completed in about a year. The new plant will make it possible to increase the amount of gasoline manufactured considerably, including gasoline to meet any specifications. Trinidad crude is heavy and production of the refineries at the present time is approximately 50 percent fuel oil.

At United British Oilfields refinery vacuum and blown asphalt plants were completed during the past year.

Both Trinidad Leaseholds and United British Oilfields are operating apprentice training schools. Apprentices spend one year in the trade shop learning carpentering, welding and forging. At the end of that time it is decided what trade the boys are best fitted for. They are then sent out into different departments of the refinery and field for further training. Altogether apprentices receive five years training consisting of both technical and general education, and then they may either be employed by the company as B-class journeymen or seek employment elsewhere. At Pointe-a-Pierre 80 percent become company employees. At the end of five years boys of special promise may receive two more years of education leading to a supervisory position.

Wages paid in the oil industry are the highest in the colony. The oil industry has only been established 30 years, but 105 employees have had 25 years service, 250 over 20 years, and nearly 2,000 over 10 years. Trinidad owes its prosperity to a great extent to the petroleum industry. Of the $131,789,585 worth of commodities exported in 1949, petroleum, asphalt and their products were valued at $102,177,315 or 77.5 percent of the total. Of the total revenue of the colony, the petroleum industry was responsible for 42.7 percent, including $18,918,170 in direct contributions and $2,394,109 through excise duties levied on petroleum products. In addition the industry has contributed to Trinidad's position as a world port, both for ships and aircraft.

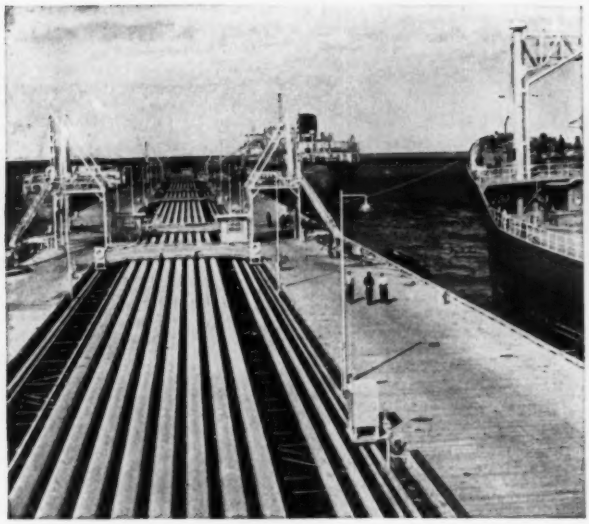
A drilling rig in the Brighton field from which one well is being directionally drilled to the Forest sand under the bay and one drilled vertically to the same horizon on shore. Photo courtesy Antilles Petroleum Co.



Dual completion in the Brighton field. One well is producing from the upper and the other from the lower Nariva sand. Photo courtesy Antilles Petroleum Co.

Jetty at Point Fortin from which ships are loaded. Tankers anchored off-shore at right are being loaded by barges. A Shell photograph.

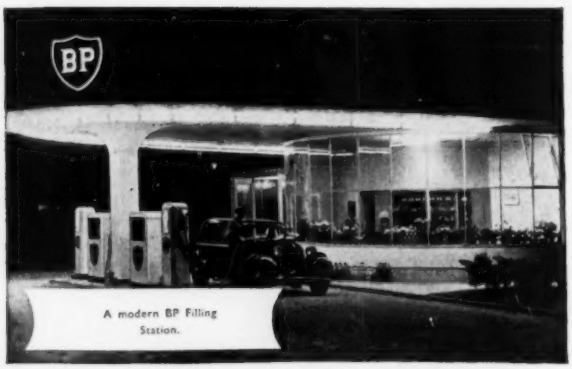
Oil Transport and Services



The perpetual motion of oil on its complicated journey from field to filling station is being accelerated constantly by Anglo-Iranian's international transport organisation. Above is a view of ocean-going tankers at an oil-loading jetty.

The first cargo of oil arrived in February this year at Anglo-Iranian's new deep-water, off-loading installation at Finnart on Loch Long, Scotland. From here the oil makes a coast-to-coast journey by pipeline to Grangemouth refinery.

Many famous international airlines are regularly served by the BP Aviation Service.



A modern BP Filling Station.

OIL PRODUCERS and refiners in the Middle East since 1912, Anglo-Iranian Oil Company and its associated companies operate eleven refineries in the United Kingdom, France, Germany, Italy, Israel, Irak, Kuwait and Australia. Their sales organisation includes major marketing or supply interests in Europe, Asia, Africa and Australasia, with international ships' bunkering and aviation services.

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McMurrey Completes Refinery Modernization

Show-window of the McMurrey plant is the brilliantly lighted central control room at left and the blower room. In background is the single-vessel cat cracker and main fractionator.

McMURREY Refining Company has recently completed a program of enlargement and reequipment of its plant at Tyler, Texas, which makes it a noteworthy example of the efficiency which modern refining technique makes possible for the small operator. The design and installation of the new facilities was handled by the Refinery Engineering Co. of Tulsa, Okla. The changes in processing equipment include the following:

Revamping the thermal cracking unit to a coil-only visbreaker with vacuum flashing of the flash chamber bottoms to produce cat cracker feed.

Installation of a 3,800 b/d single vessel type Universal Oil Products fluid catalytic cracking unit charging visbreaker distillate and excess kerosine with a designed gas oil disappearance of 72 percent.

A new single stage 75-psig pressure absorption unit using catalytic 4-psig receiver liquid and debutanized gasoline as primary absorption oil and cat cracker side-cut naphtha for secondary absorption followed by cat gasoline stabilization.

A non-selective catalytic polymerization unit charging liquid propane-propylene and butane-butylene from the Dubbs thermal cracker debutanizer overheads, using a multiple bed chamber type reactor. The fractionating system is designed to produce 10-psi polymer gasoline and spent B-B, with propane and lighter going to fuel.

Revamping part of a 2-coil thermal cracking unit into a single coil unit charging cat cracker gas oil and straight run naphtha. Straight run gasoline is stabilized together with the thermal gasoline.

Aside from the changes in processing equipment the new buildings of the plant give it a very modernistic appearance. They include a central control room, a blower house and compressor house. An elaborate truck dock has been constructed as all deliveries leave the plant by truck.

A heater, flash column and contact condenser form the combined visbreaker vacuum unit. Here crude residuum from the topping unit is heated to moderate temperatures, lightly cracking the heavy crude molecules to provide maximum quantities of gas oil charge for the cat cracker. The columns separate the products of this process into the desired fractions.

The catalytic reaction takes place in the reactor regenerator. These two vessels are mounted in a single column with the reactor above and the regenerator underneath. In the upper section the vaporized gas oil is brought into intimate contact with the finely divided catalyst particles.

The charge is converted into gas, gasoline, naphtha, cycle stocks and coke. The spent catalyst flows by gravity into the regenerator below where coke formed in the reaction is burned off with air. The hot regenerated catalyst falls from the regenerator into the charge stream. The residual heat in the catalyst vaporizes the charge. The catalyst is carried back into the reactor in the vaporized stream, completing the cycle.

The products of reaction, consisting of gas, gasoline, naphtha and cycle stocks, are cooled, condensed and separated in the main fractionating column. They are then withdrawn in the desired boiling range fractions, the gas and gasoline in vapor from the top, the naphtha lower down and the cycle streams from a still lower point.

In the gas from the main fractionator there are still desirable constituents which cannot be liquefied under its operating conditions. In the gas concentration unit these gases are compressed to 75 pounds pressure, recontacted with and absorbed in the gasoline fraction at this higher pressure.

This liquid stream is again fractionated into gas, light hydrocarbons, and gasoline. The gas is burned in the refinery fuel system, the light hydrocarbons furnish feed to the poly unit, and the finished gasoline stock goes to further treating.

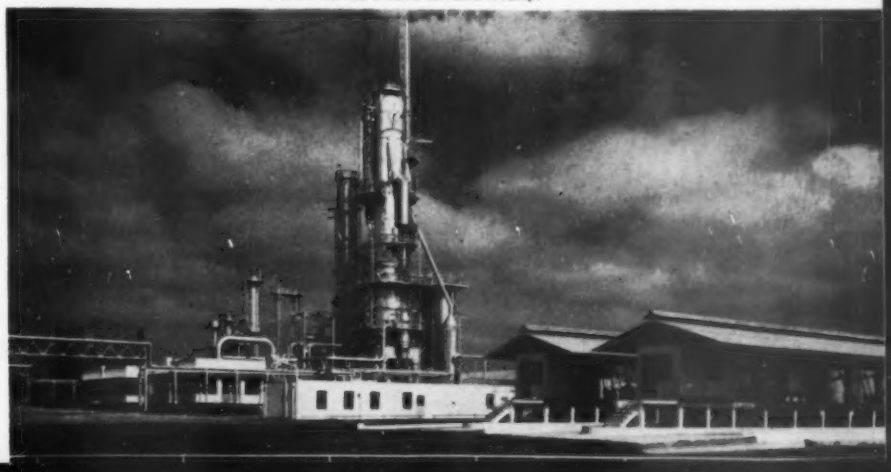
To cool and condense the fractionated products, 6,000 gallons per minute of cooling water is circulated through the exchange equipment and over a new induced draft cooling tower. This dissipates 45 million BTU's per hour to the atmosphere. In terms of power, this heat represents the equivalent of three 6,000 horsepower diesel locomotives. The water circulated is sufficient to supply the needs of a city of over 75,000 people.

In the light hydrocarbon stream from the gas concentration unit, about one-half is made up of olefinic compounds, propylene and butylenes.

Under the proper catalytic conditions these olefinic compounds polymerize to very high octane gasoline fractions. In the polymerization reaction, just the opposite of the cracking reaction, light molecules combine to form higher boiling fractions. This fraction, poly gasoline, with an octane number of about 100, can be used in aviation gasoline or to enrich motor gasoline. The reaction takes place at a moderately high pressure of 500 pounds at 400 degrees and in the presence of phosphoric acid catalyst. The unchanged, saturated propane and butane are separated by fractionation from the poly gasoline. The butane is used in final blending of gasolines to control vapor pressure, or is disposed of as LPG. The propane gas goes to refinery fuel, or may be used as a component of LPG.

In the processing facilities the various liquid streams are separated into the desired boiling range fractions. These are base stocks, and are further treated and blended together to meet stringent specifications. Gasoline stocks are treated to remove or change the form of objectionable sulfur compounds. They are also treated to prevent formation of gum. The stocks are then carefully blended for vapor pressure, distillation and octane number, with the addition of tetraethyl lead. Other stocks, naphtha, kerosine, diesel fuel, distillates and burner oils, are treated to meet product requirements and blended for flash point, viscosity, and distillation.

General view of new processing units. In the foreground is the truck rack from which eight transport trucks can be loaded simultaneously.



IF ROPE COULD TALK...

"This shouldn't happen in reel life"

Of course, the above is an exceptionally bad case, but it does show what can happen.

Ropes should be handled with reasonable care. Never drop the reel from lorries or wagons. If there are no lifting slings, place a bar through the central hole of the reel and lift by chains or rope blocks. Failing that, make an improvised ramp from battens or old sleepers.

UNLOADING. Use the ramp—no kinks this way !

Next comes STORAGE. Always select a clean, dry spot under cover or sheet down the rope for weather protection. Keep the reel off the ground on simple wood or steel "A" frames or cradles; old sleepers again come in useful for making a simple cradle. And don't forget to grease the coils and cover them well.

STORAGE. Keep reels off the ground in a simple cradle.

Pin up this announcement where your staff can see it. It is issued in the interests of longer rope life by

British Ropes Limited

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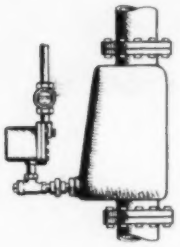
SPIRAX LETTERS — NO. 8



Separate it early

MANY STEAM MAINS are really steam and water mains. And because they carry water they carry trouble.

Even in well-lagged mains there is bound to be some water, and the rate of condensation increases as the efficiency of lagging decreases. Priming, especially in hard-pressed boilers, adds greatly to the load of water in steam mains.

The more water allowed to collect, and the farther it is permitted to travel along the mains, the more trouble can be expected from waterhammer and leaking joints and the wetter becomes the steam.

The water should be drained early and at every convenient low point in the mains. *At each drainage point there should be an ample collecting pocket so as to remove the water from the path of the steam.*

The most effective collecting pocket for both condensate and priming water is a Steam Separator (such as the Spirax type), draining through the correct type of steam trap.

Drawing T.125 (copies on request) shows twelve recommended arrangements for removing water from a variety of steam transmission lines.

Each of these Spirax Letters aims to give useful information on some aspect of steam plant management. The complete series is an aide memoire on efficient steam utilisation for process and heating. Back numbers are available.

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Please send a copy of Drawing T.125 showing twelve arrangements for draining steam mains and the use of Steam Separators.

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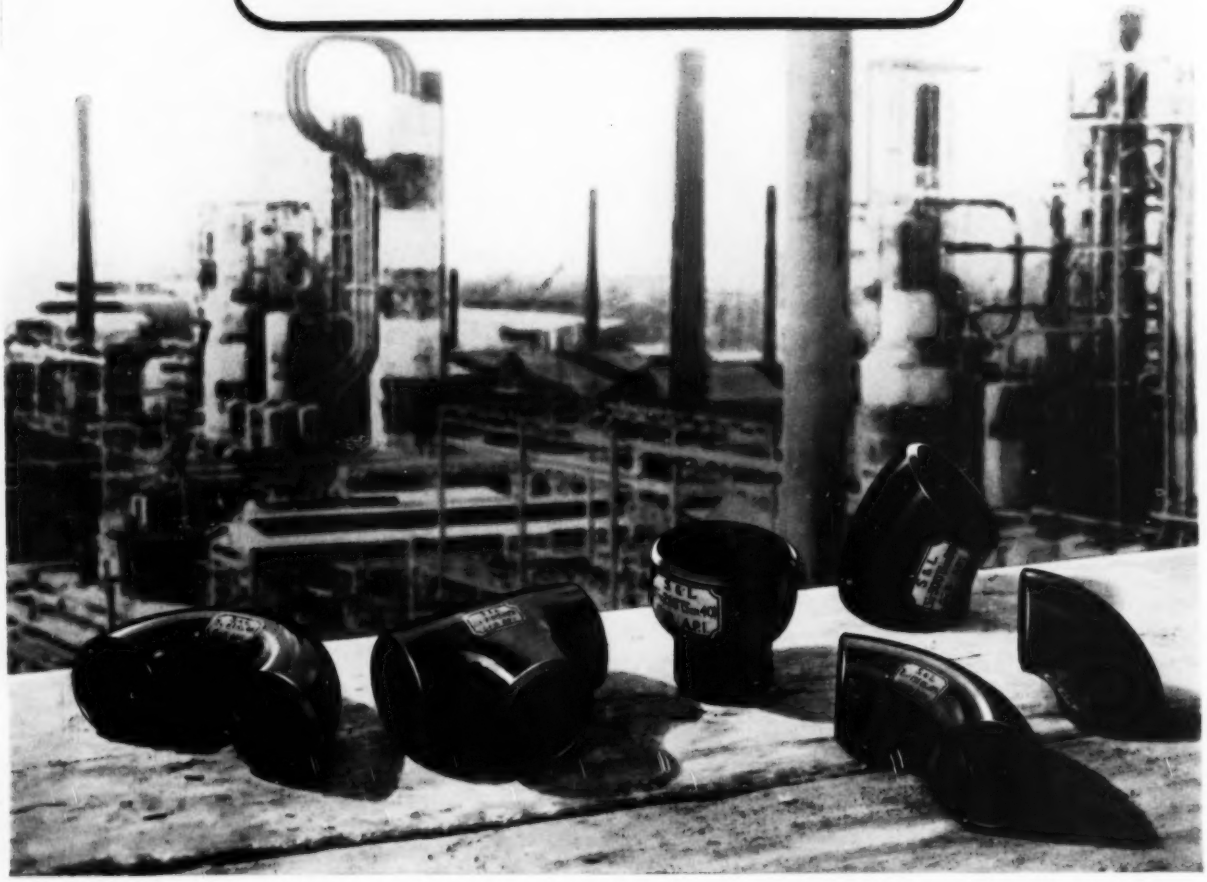

Dr. A. H. Cooper | Dr. J. D. Clary | W. K. O'Loughlin | K. E. Prince

Enlarges Technical Staff

Four new appointments to technical posts in The Davison Chemical Corp. have been announced by Dr. Paul W. Bachman, director of research and development.

Dr. Joe D. Clary has been named superintendent of the specialty catalyst plant operated at Curtis Bay (Baltimore) by The Davison Chemical Corp. This plant develops and produces a broad range of catalysts for experimental, research and production purposes. He comes to Davison from the Chemical Products Corp. of Cartersville, Ga., where he was technical director.

Dr. Albert H. Cooper has been appointed head of the research engineering department of the research and development division. He has come to Davison from Bucknell University where he was professor and head of the department of chemical engineering.

Walter K. O'Loughlin has been appointed manager of the development department of the research and development division. He comes to Davison from the intelligence department of the air forces. Before that he was with Commercial Solvents Corp.

Kenneth E. Prince has joined the company as head of the patent department. He was formerly with Phillips Petroleum Co. as a patent solicitor and was subsequently engaged in private practice.

Sun's Heavy Capital Expenditures

Sun Oil Co. is engaged in a two-year construction and modernization refinery program that will cost in the neighborhood of $40 million. In addition, Sun has contracted with Sun Shipbuilding & Dry Dock Co. for two super-tankers of 30,000 deadweight tons each. These will be constructed during the next 15 months at a cost for the two of approximately $15 million.

The refinery program will increase the company's total refining capacity between 35,000 and 40,000 barrels a day, increase its output of lubes and aviation gasoline and permit large volume production of benzene and other aromatics.

In addition to its refining program Sun will invest $20 million for production facilities, $6.8 million for transportation and $4 million for other facilities this year. Total capital investment for the year is estimated at $45 million, bringing the post-war total to $250 million.

Largest single item in the two-year refinery program is approximately $10 million for construction of a 10,000 to 15,000 b/d refinery at Sarnia, Ont., Canada. This will include a Houdriflow catalytic cracker. Under design at Marcus Hook is an aromatics purification plant to produce more than 13 million gallons a year of benzene, 30 million gallons of toluene and 15 million gallons per year of aromatic aviation gasoline blending stock. A Houdriformer unit is being built to provide feed stock to the Arosorb unit. It is designed for the catalytic reforming of 13,000 b/d of low octane napthas.

Under construction at Marcus Hook refinery is a lubricating oil plant with a capacity of 250,000 barrels a month of finished, high-grade lubricants. This is a combination crude and vacuum distillation unit for producing napthenic-type lubricants.

Another Marcus Hook installation is a propylene polymerization plant. Currently propylene is partically recovered with propane for liquefied petroleum gases, or burned as fuel. This plant will have a charging capacity of 6,000 barrels a day.

A large ammonia refrigeration unit is being added to the alkylation plant to improve summer cooling and increase aviation gasoline output 1,000 b/d.

Other scheduled Marcus Hook projects are a plant for producing sulfonates and napthenic acids; extension of docks to accommodate the new super tankers; construction of additional storage; construction of shops and locker buildings for employees, and additional improvements to existing lubricating oil, catalytic cracking and tetraethyl lead blending units to increase their efficiency and output.

The principal project planned for Sun's refinery at Toledo, Ohio, is a 10,000-barrel catalytic naphtha reformer using the Universal Oil Products Co.'s Platforming process, together with additional tankage and auxiliaries and the construction of a 4,000-barrel propylene polymerization plant. Other scheduled Toledo projects are additions and improvements to existing plants to increase charging capacity; additional storage tanks, and expansion of products pipe line capacity.

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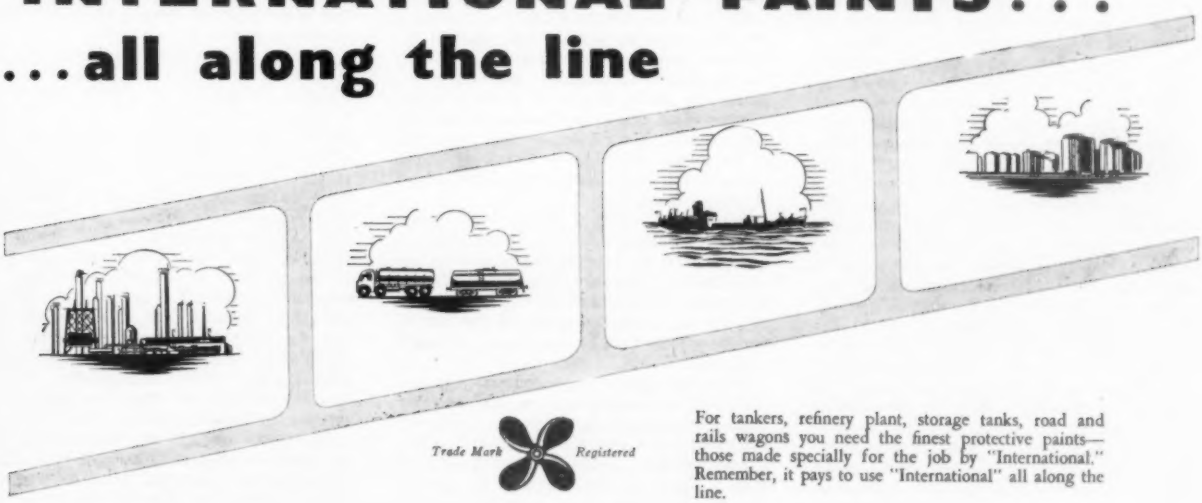

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Italy Frames New Laws To Cover Oil Exploration And Pipe Line Construction

By Prof. Saverio Ilardi

TWO new laws relating to the Italian petroleum industry have been drafted by the Council of Ministers and submitted to the Italian parliament for ratification. The intent of this legislation is to replace the existing confused mass of old laws and decrees with a system of uniform rules and regulations which will define the rights and duties of oil operators and their relations to the government which possesses paramount ownership of all underground mineral resources.

One of these projected laws relates to the prospecting for and the exploitation of underground deposits of oil and gas. This proposed law is divided into three parts: one relating to prospecting, one to exploitation, and the third to circumstances common to the two others. As regards prospecting, the provisions of the new law apply only to projects covering a continuous area greater than 3,000 hectares, but not more than 50,000 hectares. Concessions for smaller areas are left under the control of existing regulations governing the mineral industry.

Additional concessions cannot be granted to persons or companies, where the enterprise is under a single control, if the whole area under such control would exceed 300,000 hectares in the whole territory of the state, or more than 150,000 hectares in the same region. The minimum width of the conceded area shall not be less than a fifth of its length. The concessionaire must submit his technical and financial program, with an estimate of time required for prospecting and test drilling and estimate the minimum expected expense, for approval of the Minister of Commerce and Industry, who will judge the technical and economic capacity of the applicant.

The duration of the concession is three years. The concessionaire has the right to apply for two successive extensions of two years each, depending on the degree to which he has fulfilled his obligations. If he has found a promising deposit, his time limit for bringing his discovery into production may be extended up to 12 years from date of the original application. Work on prospecting must begin in six months, and test drilling within 18 months after issuance of the grant. The concessionaire must report to the mines authorities all the geological and geophysical data he collects. He will furnish regular reports on his operations and their results and answer all questions asked by the authorities, to whom he will deliver samples of solid, liquid and gaseous materials collected during the work.

During the period covered by the permit, the permittee will pay in advance an annual fee of 100 lire for each hectare under concession, and a surcharge of 2.00 lire for the first biennium and 3.00 lire for the second biennium. The concessionaire may renounce part of his area. The area for prospecting will be reduced 25 percent after the first concession period and the residue 25 percent at the end of each extension.

Areas in excess of 3,000 hectares now under prospection are to be subject to provisions of the new law and confirmed if the Minister finds that all obligations have been met. Possessors of existing concessions must apply for confirmation within 90 days after the law takes effect.

When a concessionaire has found a deposit of liquid or gaseous hydrocarbon and has complied with all requirements of his permit, he may apply to the Superior Council of Mines for confirmation of his right to possession of the said deposit. The duration of this concession of possession is 20 years, and will be subject to two extensions, each of 10 years if the program of operation in the previous period has been complied with. The production program for the new extension must have approval of the authorities, who may impose special obligations regarding the production of gaseous hydrocarbons in order that future recovery of liquid hydrocarbons may not be jeopardized.

The concessionaire must follow a "rational" exploitation of the deposit, make regular reports to the authorities on production and on the progress of development work carried out within the limits of the concession, furnish samples of all materials obtained and comply with all laws and regulations and the terms of his permit according to directions of the mines authorities given in the interest of rational operation.

The concessionaire must pay to the state an annual excise of 1,000 lire for each hectare comprised in the concession and also an annual royalty commensurate with the effective production and the market price of the product. If not otherwise arranged the annual royalty will be fixed by the Superior Council of Mines.

Whenever operation of a concession is prejudicial to prospecting and operation on other mineral enterprises the Minister of Industry and Commerce will hear the interested parties and will render a decision that will harmonize their interests in the matter of production. The Minister may award indemnity to the damaged party.

General provisions of the law provide for arbitration of disputes between the mines administration and concessionaires when the latter's rights are involved. Holders of permits are obligated to take precautions against damage to the means of prospecting and exploitation and to avoid damage to agriculture. The state reserves the right to issue permits on any concession for drilling to different depths; in cases where a concessionaire does not wish or is not equipped for deep drilling concessions may be vacated if work is not begun in the prescribed time, if the announced program is not strictly executed, if deposits discovered in the prospecting are not claimed in time, if work is suspended without authorization, if prescribed payments are not made, if the permit or concession is alienated without approval, or in case of failure to observe any other obligation.

The other project of law submitted by the Council of Ministers to the Italian parliament relates to the construction and operation of oil pipe lines and gas pipe lines.

Up to the present there has been no Italian legislation that would permit the construction and operation of long-distance conduits for the transportation of oil and gas. Within the past few years the matter has become urgent, especially as regards natural gas. There is an immediate necessity to provide transportation for 500,000 cubic meters of gas a year from the wells to the centers of consumption, and in view of the efforts to stimulate prospecting for oil and an increase of refining activity the question of oil pipe lines becomes of importance. Specific legislation in this field is necessary to promote the public interest and to protect private rights.

Existing legislation, dating back to 1934, is barren of any provision relating to long distance oil and gas pipe lines. Heretofore a mineral enterprise in the character of a public utility, could acquire authority to construct works necessary for the storage, transport and benefication of materials extracted from its deposits, even beyond the perimeters of its concession, or on public or private property. Another existing law applies specifically to works outside the public maritime domain, in the territory of littoral communities, or communities situated along navigable streams and canals connected with the sea, which have had the right to construct pipe lines that would enable them to receive or to ship petroleum liquids, subject to regulation by the Ministry of Marine. Thus the right of a refinery to construct works enabling it to unload crude oil and ship refined products was already embedded in law, and it is logical to extend this principle to occupy, in the public interest, the land necessary for the functioning of such establishments, even far beyond the limits of their properties. Such facilities have become a necessary part of their equipment.

The new pipe line law comprises 19 articles in two chapters, one which regulates the establishment and operation of oil and gas pipe lines, and the other fiscal and penal matters.

The first article declares that the construc-

tion and operation of oil and gas lines and works designed for the service of these lines are subject to concession by the Minister of Industry and Commerce according to regulations specified in the subsequent articles.

The contemplated concessions do not apply to oil or gas lines that form part of an urban distribution system, or the gathering lines of a producing field, the internal lines of an establishment, or lines that connect the establishment with points for discharge and loading, if such service lines are not more than 10 kilometers long. Applications for concessions must be published in the territories where the works are to be executed, and opposition to the projects may be presented to the Minister within 30 days. Projects that are to occupy military areas or public lands must be submitted to the appropriate administrative office.

Article 4 prescribes that the concession will not be granted for a period of more than 50 years, but this term may be extended. At the termination of the concession the pipe line and subsidiary works revert to the state. Transfers of concessions must have approval of the Minister of Industry and Commerce. The rights of the concessionaire include the right to occupy with means and materials the area necessary for constructing the line and its accessories either on, under, or above the surface, and to introduce thereon the personnel necessary for construction, operation and maintenance, and in general to exercise the functions of a public utility.

In cases of emergency the Minister may issue a provisional warrant for occupation on the posting of a bond to secure indemnity to the owner, who must be protected from deterioration of the value of his property. Competent authorities may petition the minister to order removal of the line and its accessories, in which case the operator must be indemnified.

The concessionaire must pay the state an annual tax according to the length of the line and the square of its diameter; for each meter of length a line 25.4 millimeters (one inch) in diameter will pay a tax of two lire. Control of the construction and operation of the line may be delegated to the Department of Mines or other appropriate organ. The law will apply to lines already in existence or under construction unless such projects are denounced to the Minister within three months.

The law provides that if a land owner objects to the entry of surveyors for study of a proposed line, the minister may issue his warrant, if a bond is posted against damage.

Recognition of an exclusive right for the projection and distribution of hydrocarbon gas within the limits of a commune does not preclude (other) enterprises for production, transport and distribution of natural gas whose lines pass through the territory of the same commune, from distributing gas for industrial use and for heating.

Persons who build or operate a pipe line without a concession are subject to a fine of five million to 25 million lire, and may forfeit the right to a concession. Persons committing acts likely to impair the safety of a pipe line or the public safety may be imprisoned one to five years. If such acts result in disaster

(Please turn to page 86)

Chapman Views Mexican Oil Situation

Senator Antonio L. Bermudez, left, director of Petroleos Mexicanos, escorts U. S. Secretary of Interior Oscar L. Chapman around one of Mexico's producing areas.

MUCH comment and speculation was aroused both in Mexico and the United States by the visit to Mexico in the last week of July of Secretary of Interior Oscar L. Chapman of the United States accompanied by Bruce K. Brown, executive head of the Petroleum Administration for Defense. The simple explanation given by the Interior Secretary on his return was that the trip was made on invitation of the Mexican government and of Senator Antonio Bermudez, chief of Petroleos Mexicanos, and that it was undertaken to obtain a fuller personal understanding of Mexico's oil industry and its problems. The visit was not inspired by any late development in the oil situation but had been in contemplation for several months. The Secretary added that late in September he hoped to make a similar trip to Canada for a quick view of petroleum and minerals development there.

While the subject of Mexico's need for steel in order to carry on its program of expanded drilling and pipe line construction was discussed in the course of the visit, Secretary Chapman apparently was not in a position to make positive commitments beyond his previous assurances that the Mexican petroleum industry is recognized as being "of prime importance" from the viewpoint of hemispheric security and that United States officials would make every effort to help Mexico in the procurement of materials for the industry.

The Secretary would make no comment more specific than that Mexico would get steel but that his trip would have no bearing on the amount.

It is recognized that steel is the crux of requirements for increased oil and gas production and transportation both within and outside the United States and that the supply that can be made available is insufficient to meet the full needs of the industry as these have been carefully defined. For the third quarter of the current year the allotment of steel to Mexico was estimated as sufficient for the drilling of 65 wells out of a total allocation for operations outside the United States calculated to enable the drilling of 635 wells. Mexico's program as announced earlier in the year calls for a minimum of 300 wells in 1951.

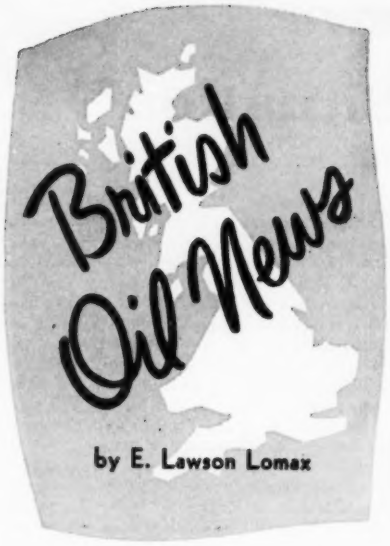
Mexican oil industry officials are particularly anxious to obtain pipe for the laying of something over 600 miles of gas lines to improve the country's internal distribution facilities as well as an oil line across the Isthmus of Tehauntepec in connection with a proposed refinery on the Pacific Coast. Since it is realized that demands for line pipe are far beyond current mill capacity, Jose Colomo, assistant technical director of Pemex, recently made a trip to Europe to study the possibility of obtaining supplies from Germany, Italy or France. While no authoritative statement has been made as to the result of this quest, unofficial reports are that some orders have been placed but that these are falling short of meeting the country's urgent needs.

Mexico also wants steel for a number of other projects related to the oil industry including the construction of docks, warehouses, storage tanks and terminal facilities at Tampico, Vera Cruz and Acapulco, the completion and enlargement of plant improvements and new installations at Poza Rica, the addition of desulfurization units to refineries at Atzcaputzalco, Ciudad Madero and Poza Rica and the building of a kerosine treating plant at Atzcaputzalco, these in addition to pipe lines and the projected Pacific Coast refinery.

While it is realized in Mexican oil circles that not all of its needs can be immediately satisfied, there is encouragement among them over the visit of Secretary Chapman and Deputy Administrator Brown as marking a new degree of sympathetic interest in the development of Mexico's oil industry on the part of the United States. They are particularly pleased with the Secretary's statement that the industry is being well conducted and Mr. Brown's observation that the installations he visited are not overstaffed and are well run.

Heads De Laval Sales

Wencel A. Neumann, Jr. has been elected vice president of Industrial sales of De Laval Steam Turbine Co., Trenton, N. J., and will be responsible for the industrial and commercial sales of De Laval steam turbines, pumps, blowers and compressors, IMO rotary pumps and power transmission equipment. H. G. Bauer has been elected vice president of engineering and will also continue as manager of marine sales. He was previously vice president and executive engineer. Mr. Neumann, the new vice president of industrial sales, has been associated with De Laval since 1946 and most recently as manager of the IMO-De Laval products division. Previously he was with Westinghouse Electric Corp. and also served as an officer in the U. S. Army Ordnance.



LONDON

Decision of the British government announced early in August to send an official mission to Teheran in response to an invitation from the Iranian Premier to discuss conditions arising from the seizure of Anglo-Iranian Oil Company properties was received with interest in British oil circles, but with no great confidence that it would lead to a workable solution. There is appreciation of the interest taken by President Truman and praise for the efforts of W. Averell Harriman and his associates in bringing about a reopening of the discussions, but doubt as to whether the extremists who control Iran are willing to take a realistic view of the disastrous position into which they have plunged themselves.

Unwilling to reject any opportunity for a possibly acceptable agreement, Downing Street decided to accept the Iranian offer at face value and selected an official of full cabinet rank in the person of Richard Stokes, Lord Privy Seal, to head its delegation to Teheran. Negotiations at the present writing appear to be following a desultory course, but afford some hope of ultimate agreement.

It is satisfactory to note that the big tanker fleet of the Anglo-Iranian Oil Co. Ltd., consisting of nearly 150 company owned vessels, together with a large number on time charter, is at time of writing, and in spite of stoppage of shipping operations in Persia, operating at slightly over 90 percent of its capacity, and this solely in the company's own business activities.

An event much nearer home that promises to fill, to a substantial degree, the gap in the supply of products caused by the closing of the great Abadan refinery is the formal opening of the new Fawley refinery of Esso Petroleum Co. Ltd. The importance attached to this development is indicated by the fact that Prime Minister Clement Atlee accompanied by Mrs. Atlee will journey to Southampton to perform the official opening ceremony which will take place on September 14.

This new refinery, largest in Europe, was originally planned for completion in 1952, but through the energy of the engineers and constructors the scheduled date has been beaten by several months. Certain units of the refinery have been in operation for the past several weeks. When it reaches full operation it will have a throughput of upward of 130,000 barrels daily, representing about 25 percent of the refining capacity of Great Britain and estimated to save the country over two million dollars a week in foreign exchange. The opening ceremony at the plant will include the unveiling of a silver plaque designed by one of Britain's leading artisan craftsmen commemorating the occasion.

Esso Makes Appointments

It is announced by Esso Petroleum Co. that R. J. Pinder has been appointed general sales manager in succession to H. C. Tett who, as recently announced, was elected to the board of directors.

Mr. Pinder joined the company at its Birmingham office 30 years ago, and has been deputy sales manager since 1950. Before the outbreak of the late war he had an extensive experience of marketing problems in most of the countries of Europe.

G. W. Powell has been appointed to the post of deputy general sales manager in succession to Mr. Pinder. Mr. Powell was manager of the company's southwestern division since 1939, with the exception of the war years, during which he was manager of the southwestern region of the Petroleum Board.

W. H. Critchlow M.B.E. has been appointed assistant general sales manager. He has been with the company since 1920. During the war he was regional manager, northeastern division of the Petroleum Board, and was awarded the M.B.E. for his work in this connection. After the war he was manager of the company's midland division.

R. J. Pinder G. W. Powell

Another new Esso appointment is that of H. W. L. Legg to the post of manager of London division. He was educated at Manchester Grammar School and went to Germany after the first world war with the army of occupation. After demobilization he was with Mather and Platt and Vacuum Oil Co., and joined Esso in 1930. During the war he was with the Ministry of Fuel and Power in London as trade adviser and liaison officer with other ministries and the Petroleum Board.

H. W. L. Legg W. H. Critchlow

CHARLES HOPE LUMLEY O.B.E. has been appointed director of home sales (industrial) of Sigmund Pumps Ltd., London. Throughout the last war he was regional controller for the North of England of the Ministry of Supply. Since the end of the war, he has held, under the Foreign Office, the office of economic controller, Hamburg.

Capt. D. W. Mason Capt. J. P. Thomson

Eagle Oil and Shipping Co.

On July 31 Capt. J. P. Thomson retired as Marine superintendent after 17 years and is succeeded by Capt. G. W. Mason G.C. These two captains have outstanding records in the mercantile service both in peace and war.

Capt. Thomson has carried out many special towages including those of disabled vessels together with many rescues of shipwrecked crews. One of his outstanding achievements was the development of the "Palk Straits Scheme" during the late war, when the 18,000-ton tanker "San Felix" formed the center of a storage and transfer depot and served in effect as a floating harbor. Between June 1945 and October 1945, 71 vessels were handled and 287,000 tons of aviation spirit transferred.

Capt. Mason G.C. commanded the S.S. Ohio in the historic Malta convoy action of August 1942, in which he gained the first G.C. to be awarded to an officer of the Merchant Navy. He was apprenticed to the Eagle Oil and Shipping Co. in 1919 and is the first of the company's apprentices to have risen to the rank of marine superintendent.

Senior Chief Engineer D. Ewan O.B.E. of the Shell tanker fleet has retired after 35 years continuous service with the fleet, during which he spent 28 years actually at sea. He was awarded the O.B.E. in the 1950 New Year's Honor List for long and meritorious service in the merchant navy.

European Geophysicists Organize

Organization of the West European Geophysical Union has been announced by A. van Weelden, chief geophysicist for Bataafsche Petroleum Maatschappij (Dutch Shell), of The Hague, Holland, who said that plans are under way to affiliate with the Society of Exploration Geophysicists (headquarters in Tulsa, Okla.) as the "West Europe Local Section." The initial membership of the union is made up of 136 exploration geophysicists residing in various countries of Western Europe and includes 38 members of the Society of Exploration Geophysicists.

At the organization meeting held during the Third World Petroleum Congress at The Hague on June 4 a temporary constitution board was elected, consisting of Dr. A. A. Fitch of Seismograph Service Ltd., London; Dr. E. H. Hedstrom, of The Electrical Prospecting Co., Stockholm; L. Migaux, of Compagnie Generale de Geophysique, Paris; van Weelden; Dr. B. Baars, also of B. P. M., The Hague; and Dr. A. Schleusener of Seismos, Hannover.

Air Parade

In connection with the Festival of Britain, Shell Petroleum Company has produced a film giving in pictorial form a brief history of the progress of British aviation from the time of Bleriot and leading up to the position occupied now by the gas turbine which is denominated the aircraft power plant of the future. Some of the most spectacular scenes depicted are those showing the Hawker P1081 experimental high speed fighter in action.

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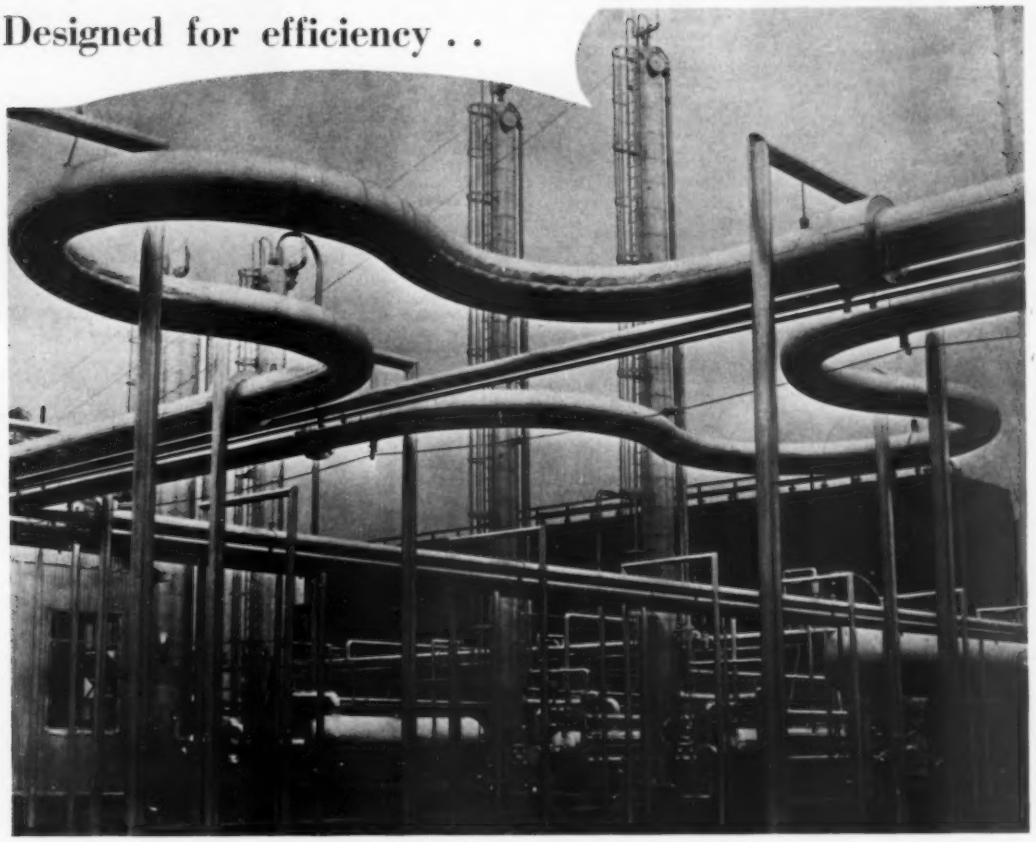

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British Oil News

(Continued from page 76)

New Type Truck For Oilfields

An unusual demonstration took place recently at Watford when a new type Seammell all-wheel-drive truck was shown. In the process of loading, the body of the truck may be tilted up to an angle of 50 degrees. This occurred at the demonstration when the point of balance was reached during the winching of a 14-ton load over the tail roller of the truck. As the load was further winched along the vehicle's platform the front gradually returned to a horizontal position.

This truck is part of an order by Shell for six of these special trucks, which have been specially designed and are destined for the oil field at Seria, in the state of Brunei, North Borneo.

Oil Company Financial Reports

The fortieth annual general meeting of Anglo-Egyptian Oil Fields Ltd. was held in London on July 3 under the chairmanship of Sir Frederick Godber. A new chapter in the company's history was opened when it was unanimously decided that the location of its head office should be changed from London to Cairo. The move is being taken to enable the company to function satisfactorily in conformity with the revised mining laws of Egypt, enabling it to be remunerated on a commercial basis for the products it produces and sells in Egypt, and also to carry on its geological work and drilling activities, and obtain new leases on promising territory.

Production during the year was 12,257,160 barrels against 12,248,080 in 1949. It is not expected to increase during the coming year, in the absence of new discoveries, pending the settlement of outstanding problems regarding new leases. A sulfur recovery plant was completed during the year, and is now in regular operation; small quantities of sulfur being sold locally.

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A successful year of operation has enabled Lobitos Oilfields, Ltd. to increase its dividend payment from the 17½ percent which has been paid over the past five years, to a total of 22½ percent which includes a cash bonus of 7½ percent. The holding company's net profit, after deduction of all charges, was £573,283 against £305,563 for 1949.

Consumption of petroleum products is rising in Peru, and as the government of that country requires the oil companies to supply crude for internal consumption at prices below cost of production, the future prospects are not altogether bright. At present, 52 percent of the company's production is used in this way, and while it remains stationary, less and less will be available for export at remunerative rates, unless the government will permit internal prices to rise to world level.

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Attock Oil Co. Ltd. reports gross trading profits for 1950 as £651,249 as against £423,023 for the previous year. After deduction for depreciation of fields and refining plant and other property, and £383,951 for U.K. and Pakistan taxation, the net profit is £120,012, compared with £101,735 for 1949. Out of this profit the directors propose paying a dividend of 12½ percent compared with ten percent for 1949.

The increase in gross trading profits is due to a large extent to two causes; (1) conversion of the rupee profit to sterling at a higher rate than in 1949, and (2) the transport and refining of crude oil from the Balkassar field on behalf of the Burmah Oil Co. Ltd's subsidiary now in course of formation in Pakistan.

Overhead crude production was 659,769 barrels as against 745,604 barrels in 1949. This reduction was due mainly to decreasing requirements from existing wells on the Joya Mair fields. Production from the Dhulian field followed its usual decline trend, but balancing this to some extent was the higher output from Balkassar.

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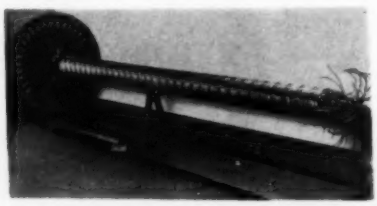
In accordance with the requirements of the Pakistan Petroleum (Production) Rules 1949; Pakistan Oilfields, Ltd. has been incorporated and registered in Lahore with a capital of Rs. 10,000,000 divided into 1,000,000 shares of Rs. 10 each. Of these, 30 percent will be offered to Nationals of Pakistan, and the remaining 70 percent taken up by the company. The object is to develop new areas in Pakistan.



Specialized Heat Exchangers

Two special types of heat exchangers have been designed and manufactured by Petrocarbon Ltd. One is designed to effect heat exchange between air and oxygen, and the other between strong and weak ammonia liquors.

The former, working under a pressure of 75 psi, contains a total wound length of 34,680 feet, ⅜ inch OD, of solid drawn copper tubing in 289 separate jointless tubes, each of which is 120 feet long, giving a total heat transfer area of 3,400 square feet. It is installed in a plant designed to produce 200 cm of pure oxygen per hour.

The second was designed as part of an ammonia absorption refrigeration plant to effect heat transfer between strong and weak ammonia liquors with flows of 1,600 gallons per hour on the tube side and 1,800 gallons per hour on the shell side.

Each of the 24, six-inch-diameter body tubes contains 26 ¾-inch OD condenser tubes, giving a total effective heat exchange surface of approximately 2,000 square feet which produces, under the conditions of operation, a heat transfer of 3.2 million Btu's per hour.

F. J. Stephens

Shell's New Managing Director

Consequent on the retirement of Sir George Legh-Jones as a managing director, F. J. Stephens has been appointed a managing director of the Anglo-Saxon Petroleum Co. Ltd., of the Shell Petroleum Co. Ltd., and a delegate member of the board of N.V. de Bataafsche Petroleum Maatschappij, The Hague, which are the three principal operating companies of the Royal Dutch/Shell Group.

Mr. Stephens joined Shell in London in 1926 and served for two years in Venezuela. In 1945-48 he was executive vice president of the Asiatic Petroleum Co. in the United States, and since that time he has been co-ordinating the Group's capital expenditure program and general finance.

Progress On Iraq's Pipe Line

Construction of the new large diameter pipe line of Iraq Petroleum Company is going ahead rapidly. Its capacity will be 13 million tons per annum, and its length 560 miles. It will follow the alignment of the existing 12-inch and 16-inch lines from Kirkuk to Mile 494 in Western Syria, where it will turn northward to Banias, the Mediterranean terminal. The eastern portion of the line from Kirkuk to the Homs Gap will consist of 30 and 32-inch pipe, while the remainder of the line on the downward gradients from the saddle of the Homs Gap to the terminal at Banias will consist of 26-inch pipe. At the beginning of July, 91 miles of 26-inch and 321 miles of 30/32-inch pipe had been shipped from the U.S.A.

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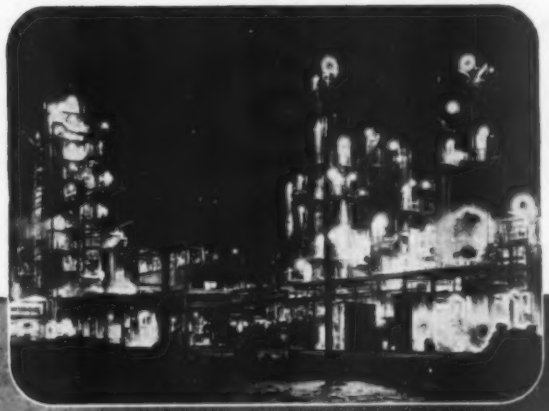

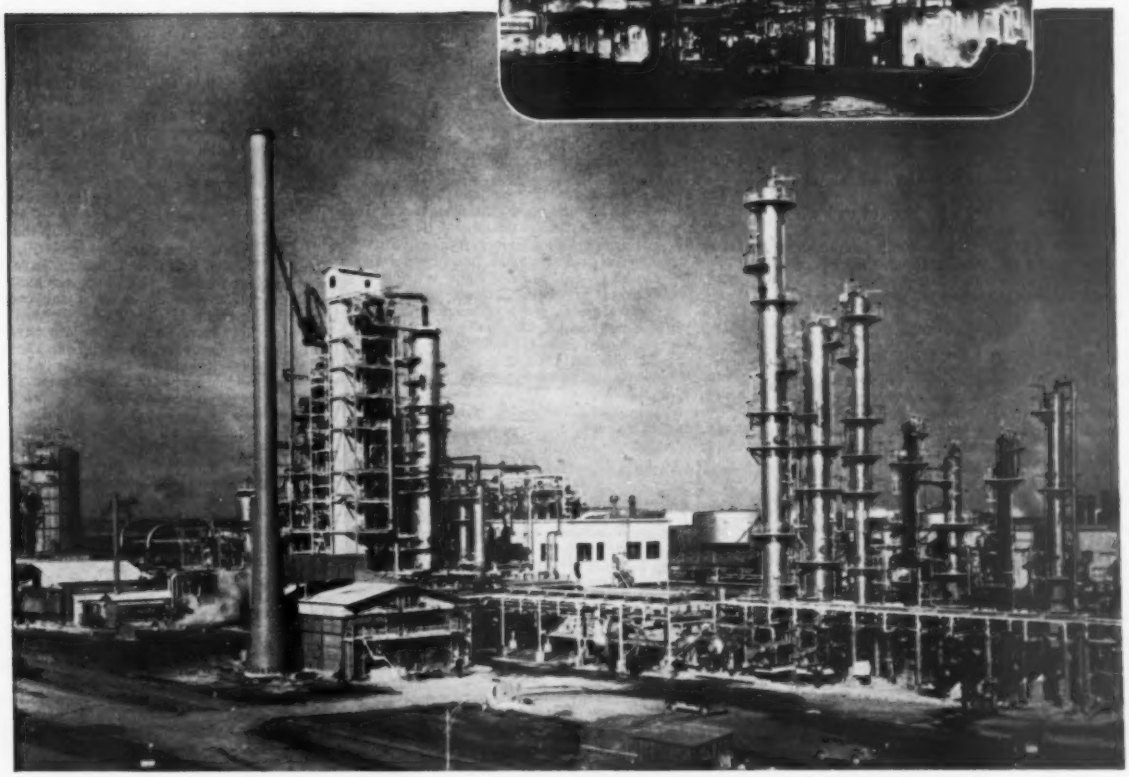

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International news and notes

Opening of Fawley Refinery

An event of international importance in the petroleum industry will be the opening of the great refinery of Esso Petroleum Ltd. at Fawley, near Southampton, England on Sept. 14. The opening ceremony will be performed by Prime Minister Clement Atlee, head of the British government.

The refinery, largest in Europe, will have a daily throughput of 130,000 barrels per day when in full operation and will contribute about 25 percent of the refining output of Great Britain. It has been under construction since 1949, engineered by Foster Wheeler Corp. from design by Standard Development Co. It includes a fluid cracking plant charging 41,000 barrels daily and complete facilities for the processing of a full line of products including lubricants and liquefied petroleum gas.

One hundred thousand tons of steel went into the construction of the plant which includes 300 miles of pipe, 12,000 valves and 220 pumps. Sixteen hundred pounds of mercury are used in the control instruments. A feature of the plant is the elaborate electrical control system which incorporates 200 miles of wiring and comprises a million dollars worth of equipment supplied by International General Electric Co. besides that manufactured in England by Metropolitan Vickers Ltd. Among the IGE installations are unit substations, motors, motor control centers, cable, conduits, lighting fixtures, and a 45-ton locomotive.

The new Fawley refinery is regarded as one of the most complete and efficient ever built and its possession is a source of pride to the people of the United Kingdom.

Trans-Northern Directors Elected

A. N. Horne, president of The Trans-Northern Pipe Line Co. Ltd. has announced names of directors of the newly-formed company, which will transport petroleum products from Montreal East to Ottawa, Toronto and Hamilton. The directors are: W. M. V. Ash, Toronto, and R. P. Ritchie, Toronto, representing Shell Oil Co.; T. C. Twyman, Montreal, and A. G. Farquharson, Montreal, representing McColl-Frontenac Oil Co.; and Robert E. Kepke, Toronto, and John R. Dawson, Toronto, representing British American Oil Co. H. H. Bronsdon, formerly secretary-treasurer of B-A, has been appointed secretary-treasurer of Trans-Northern.

German Firm to Equip SASOL Plant

The German firm Arbeitsgemeinschaft Ruhrchemenie-Lurgi is to have an important part in equipment of the SASOL plant at Coalbrook, South Africa, for the production of synthetic motor fuels. For the $50 million project which is engineered by The M. W. Kellogg Co., some $22.5 million of plant and equipment will be supplied from Germany, including $5 million for power stations and $17.5 million for vaporization and gas refinement units. The improved Fischer-Tropsch process is said to give the ovens a capacity twenty times as great as under the old method.

New Oil Zone in Brazil

The President of Brazil has signed a decree proclaiming an area in Northeast Brazil to be a federal oil reserve. The area embraces the valley of the River Vaza Barris, where geological studies were carried out in 1948-49, from Geremoabo to Brejinho das Ametistas, and thence to Canudos. Toward the end of 1949 the National Petroleum Council began test drilling in the Piranhos-Brejinho das Ametistas area, in which the American geologist, William T. O'Gara, reported the most favorable conditions. At the same time investigations were continued towards Canudos.

To Dismantle Terminal

Pemex may dismantle the former Gulf Oil Company's Prieto deep-water terminal on the Panuco River. It is planned to move former Gulf production from the fields to other terminals by Pemex pipe lines, by-passing Prieto. Premex recently loaded one tanker out of the former Gulf tank farm at Prieto and estimates indicate there is still sufficient crude stored there to load another.

Pemex Negotiates Drilling Deal

A major United States oil company has opened negotiations with Petroleos Mexicanos for a "very large" wildcat drilling contract. Six of the firm's top executives have been in Mexico for conference with Antonio J. Bermudez, Pemex director. The American company, which is not identified, is "one of the few companies considered a friend of Pemex ever since expropriation" of American oil holdings there in 1938. The company was one of those expropriated.

The area involved in the talks will include the Tabasco region of the Isthmus of Tehuantepec, where Pemex made its first important oil strike about three months ago.

The major problem of Pemex currently is an adequate wildcatting program. Investment costs and the absence of sufficient equipment have retarded the government oil monopoly's efforts. But U.S. sources point out domestic consumption is increasing at the rate of ten percent a year, and Pemex will have to seek new production sources if it is to satisfy Mexico's growing demand for oil.

It is believed the American company and Pemex are already in accord as to the basis of an agreement. Should this be true, the signing of a contract may be disclosed by President Miguel Aleman in his annual "State of the Union" address at the inauguration of Congress' next session in September.

Canada's Pacific Coast Hopes for Pipelines

VANCOUVER, B. C.

After six months of intensive exploration and survey work, oil men in Vancouver and Calgary believe that sufficient reserves of natural gas may now have been found in the Peace River district of Alberta and British Columbia to permit the building of a pipe line through British Columbia to the Pacific Coast.

A score of companies have found new gas fields or extended others in the northern sections of these two western Canadian provinces. Indicated gas reserves in the area have now reached 1.5 trillion cubic feet. This is the amount estimated by the Westcoast Transmission Co., one of the firms seeking the right to pipe gas to the Pacific Coast, as necessary to support the natural gas line into British Columbia and thence into the United States.

Construction of the line is still dependent on the Alberta Conservation Board and the Board of Transport Commissioners at Ottawa. The transport board meets in Ottawa September 24 to reopen talks on the proposed lines.

Earlier this year the Alberta board indicated that if sufficient reserves were found in the Peace River area exports would be allowed. Gas in this isolated section of the province is far removed from marketing centers in Alberta and has been more or less earmarked for export.

Large gas strikes have been made in the north in the past summer, one of the latest being that of Admiral Oils of Calgary. Admiral reports it has built up reserves of more than four and one-half billion feet in four months in the Peace River area. This company has worked with Pacific Petroleums and its gas will be added to the reserves of that company which have been increased 46 billion feet since March.

Three other large discoveries have been made on the Alberta side close to British Columbia. The well located by Hudson's Bay, Union and Texaco has flowed up to three million feet of gas in several tests and probably exceeds 30 million feet a day potential. Hi Flow Petroleums have made an encouraging find in the same area. Hudson's Bay Union Tangent No. 3, located near the 50-million cubic foot well which blew wild last winter, is believed of only slightly smaller capacity than the once-wild well.

Tests on the Hudson's Bay, Union and Texaco well were: Peace River sand test, flow rate at 1,770 feet to 1,790 feet, 2,214,000 cubic feet; Basal Gething test, 3,271-3,305 feet in 50 minutes gave 6,500,000; 3,313-20 gave 7,000,000; 3,320-30 gave 7,434,000. No fluid was found in any test.

Bidding for the right to pipe natural gas from Alberta to Canadian and United States Pacific Coast cities shares interest with the more recent but just as keen battle for oil pipe line rights, and Premier Manning of Alberta has forecast the building of a line within the next two years.

Three of the firms have surveyed the routes on which they seek permission to build an oil pipe line as the contest for a Pacific Coast oil outlet grows more intense. Independent Pipeline Co., Transmountain Oil Pipe Line Co. and West Coast Transmission have announced surveying of their chosen routes.

Transmountain, which is backed by the Bechtel Corp., has announced that Imperial Oil, Socony-Vacuum Oil Co. and Gulf Oil Corp. have become shareholders in the pipe line company. They subscribed $500,000 to be used for completing engineering and field surveys.

Bechtel has opened an office in Vancouver under the name of Canadian Bechtel Ltd. The Bechtel organization, through its connection with the oil companies, would appear to have a possible lead on other firms in the oil pipe line race.

Companies seeking right to build the Alberta-British Columbia oil pipe line are: Alberta Natural Gas Co. and Northwest Natural Gas Co., incorporated in 1950 for proposed construction of a 16-inch crude oil line to parallel a proposed natural gas line. The route would run from Edmonton to Pincher Creek, Crow's Nest Pass, Kingsgate, Spokane, Seattle and back up a branch line to Vancouver. The companies are sponsored by Brokaw, Dixon and McKee of New York. Length of the line is estimated at 980 miles.

Transmountain Oil Pipeline Co., incorporated April 1950, proposes a 24-inch pipe line from Edmonton via all-Canadian route through Yellowhead and Coquihalla Passes to Vancouver: length, 715 miles; cost $87,000,000; capacity 75,000 barrels rising to 200,000.

Border Pipeline Corp. proposes a 16-inch line with maximum capacity of 150,000 barrels. Route is similar to that of Alberta Natural Gas and would serve Seattle and Spokane before Vancouver. Length 980 miles.

Independent Pipeline Corp., sponsored by Federated Petroleums, Calgary, would run a line from Edmonton through Yellowhead and Coquihalla Passes. Independent has obtained the services of Guy S. Conners, of Williams, Connors and Stanfield as consulting engineer. Mr. Connors says the entire 721 miles of the line could be completed in one season. Line would be 22 inches for the first section, 20 for the next, then 18 and finally 16 into Vancouver, its minimum capacity 50,000 barrels, maximum 120,000. It would have three pumping stations.

Steel restrictions have delayed start on the new $10,000,000 refinery British American Oil Co. had planned for Vancouver. The projected refinery announced in March by the company would be built on the site of the present B-A tank farm on Burrard Inlet. Capacity would be 10,000 to 12,000 barrels daily.

Shell Oil of Vancouver has been awarded a $706,000 contract for petroleum products by the defense production department at Ottawa.

PROGRESS at DURBAN

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Drills First of 12 Wells

The New England Fuel Co., owned by the Neville G. Penrose interests of Fort Worth, Texas, is about to complete its first well in the Panuco field of the State of Veracruz. New England's contract, which was signed last May, provides for drilling ten to 12 wells, all located in proven areas of the Panuco field. Mr. Penrose told WORLD PETROLEUM he expects all the wells to be completed this year. He added the company has one rig working and field superintendent Birdie Brown plans to complete "a well every two weeks" at depths averaging about 1,800 feet.

The agreement is patterned on the contract of Weigand Brothers, of San Antonio, which calls for a payment of fifty American cents a barrel to the operator on all production during a ten-year period. Mr. Penrose said he expects to find "from seven to eight producers" with a production of 40 to 50 barrels per day each. Equipment is on hand to complete seven wells.

Canadian Oil and Gas Directory

The first annual appearance was made this year of the Canadian Oil & Gas Directory published by C. O. Nickle, publisher of the Daily Oil Bulletin, and Art. R. Smith, field representative for the "Oil in Canada" magazine. The directory is designed to answer many questions relative to all branches of the Canadian oil industry giving capital set-up of firms related directly or indirectly to oil development together with detailed information of all the varied activities of these branches.

Negotiates Contract with Pemex

E. N. Casey of Casper, Wyo., is negotiating a drilling and salvage contract with Petroleos Mexicanos. The contract provides for recovery of casing in abandoned wells in addition to drilling an undetermined number of new wells.

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Consider French Refinery In Mexico

Negotiations for an oil-export agreement between Petroleos Mexicanos and the Compagnie Francaise des Petroles are swinging toward the study of the possibility of the French company's building a refinery in Mexico. Previously the talks had centered on the feasibility of Pemex constructing a "large" oil refinery in France as a direct foreign outlet for Mexican refined products.

The plan for a Mexican refinery in France was originated by the Compagnie Francaise des Petroles, which has been conducting negotiations with Pemex for a straight drilling contract, but with the provision it can take out its share of the crude produced. Senator Bermudez refused to agree to that plan. At present all foreign drillers are paid in cash, not oil. But the French have been holding out the succulent bait of a $200-million drilling investment, to be financed by the New York banking house of Ladenburg, Thalmann.

Under the French proposal, Pemex would ship its own crude, refine it in France, where it would then be re-sold to French enterprise. The suggested contract would include a provision for extensive French drilling in Mexico.

Germany Imports More Crude, Fewer Products

Imports of crude oil and finished products into Western Germany (Federal Republic) during the first quarter of 1951 amounted to 964,039 tons, an increase of 17,500 tons over the preceding quarter. The rising trend of crude imports and the decline in products continued, receipts under the former category increasing by 100,000 tons to 847,218 while products accounted for only 116,821 to which motor gasoline contributed roundly 70,000 tons with diesel oil and lubricants supplying 30,000. The sharp decrease of over 65 percent in diesel oil imports led to a scarcity of supplies and higher prices. Of the crude imports during the first quarter 731,095 tons came from the Persian Gulf area and 116,123 tons from Venezuela.

Meanwhile domestic crude output continues to gain. Statistics for the month of May show a production of 112,230 tons, a rise of roundly 7,000 tons over the preceding month. The Hanover fields held the lead with 52,000 tons while Emsland produced 49,000 and Hamburg-Holstein 10,400.

Petrofina Buys Mexican Diesel Fuel

Petroleos Mexicanos has signed a contract with Petrofina, a Belgian company, for the sale of 300,000 barrels of Diesel fuel. The contract provides for delivery of from 75,000 to 80,000 barrels monthly during September, October, November and December at Gulf posted prices.

This is the first time in ten years Petrofina, Belgium's largest company, has sought fuel on the Mexican market. Petrofina executives, fearing a supply crisis in Europe, recently acquired 57 percent of the stock of the Mexican-American Independent Oil Co., known in Mexico as Cima. Cima was the pioneer U. S. firm to sign a percentage-of-production drilling contract with Pemex.

Pemex Awards Gas Line Contract

Cia. Continental, a Mexican pipe-line-laying-firm, has been given the contract to build the 15-inch gas line linking Torreon and Monterrey. Construction of the line was begun last year but bogged down in March owing to a shortage of pipe. At that time only 30 kilometers had been laid. The Cia. Mexicana de Tubos de Aceros, S.A. (Tubacero) of Monterrey, a local rolling mill now delivering its entire production to Pemex, will provide pipe for the project.

Shell To Build Ammonia Plant

Shel. Chemical Corp. will add a new synthetic ammonia plant to its other petrochemical manufacturing units at Dominguez, Calif. Construction of the multi-million dollar plant will begin this year with completion scheduled for late in 1952.

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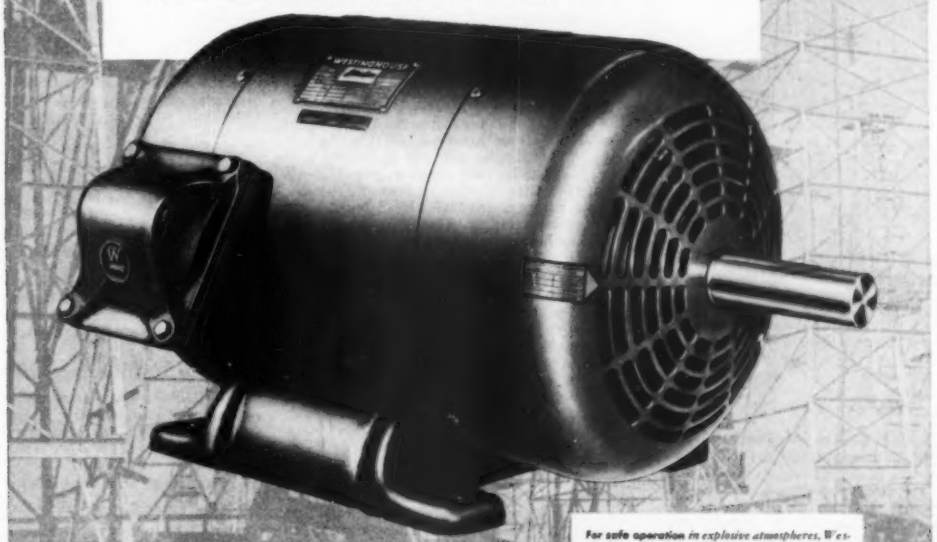

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Oil company staff changes

Dr. John E. Kircher

Joins Continental Oil Co.

Dr. John E. Kircher, formerly director of development with Stephen Chemical Co. of Chicago, has been appointed manager of Continental Oil Co.'s expanding petrochemical department. Dr. Kircher also will be vice president and a director of Sharples-Continental Corp., Baltimore; vice president and director of Petroleum Chemicals, Inc.; and a director of Continental Oil Black Corp., all Continental Oil Co. interests. His background in industrial chemistry is distinguished by work and research in the fields of synthetic detergents and synthetic rubber.

Southern Geophysical Promotions

Dr. Sidon Harris, president of Southern Geophysical Co. of Fort Worth and Midland, has announced the following personnel promotions in his company: R. H. Dana, from vice president to executive vice president; W. D. Baird, from treasurer and supervisor to vice president; and R. E. Davis, from supervisor to assistant vice president.

Mr. Dana replaces A. E. McKay, resigned. Mr. Dana has been with Southern since 1945 and previously had been with Stanolind Oil & Gas Co. in the geophysical department since 1934. Mr. Baird has been with Southern since 1947 when he came to the company from Geophysical Service Inc., which he had served for 14 years. Mr. Davis has been promoted from supervisor to assistant vice president in charge of the Permian Basin office in Midland. He has been with Southern since the company was organized in 1945. Before joining Southern, Davis was with Stanolind Oil & Gas Co. for 10 years in the geophysical department.

W. D. Baird R. H. Dana R. E. Davis

LEROY DONALD has been promoted to the newly created position of sales manager for the chemical division of Lion Oil Co. He joined Lion in 1948 as chief agronomist and has been administrative assistant in chemical sales since Sept. 1949. Richard W. Goldthwaite has been named an assistant sales manager of the chemical division.

ROY M. TEEL has been appointed assistant to the manager of the natural gasoline department of Phillips Petroleum Co. H. R. Legatski, who has been superintendent of operations, has been named project development engineer for Phillips Chemical Co., a subsidiary. In this newly created job he will evaluate the technical aspects of projects for the company. Louis P. Sumpter succeeds him as superintendent of operations.

In other changes W. L. Culbertson has been appointed chief engineer in charge of the engineering division succeeding Mr. Teel; C. R. Ringham has been appointed director of the section of coordination and analysis of the engineering division succeeding Mr. Culbertson; L. H. Moore has been appointed superintendent of the division of contracts and settlements, with R. H. Clark to direct the settlement section; H. R. Markley has been named assistant to Mr. Sumpter in charge of plant operations, and W. L. Phillips has been appointed western district superintendent of Odessa, Texas, to succeed Mr. Markley.

D. J. WINTER has been appointed sales manager of The British American Oil Co. Ltd. in charge of product sales and the development of markets in Canada. Mr. Winter joined B-A's Manitoba marketing division in 1936. He became advertising manager in 1946. He later became central regional manager, which position he held at the time of his new appointment.

DR. P. C. WHITE has been appointed manager of research and development for Pan American Refining Corp. He will make his headquarters at the company's main research laboratories in Texas City, Texas. Dr. White comes to Pan American from the research department, Standard Oil Co. (Ind.). He entered the petroleum industry in 1935. His research experience has covered many fields, including thermal cracking, alkylation, hydrocarbon synthesis and pilot plant work.

M. C. Hopkins, previously coordinator of research and development at Texas City, has been made technical director. He will be responsible for all phases of chemical engineering work. Dr. J. E. Kasch advanced from assistant director to associate director. Working directly under Mr. Hopkins, Dr. Kasch will be in charge of process development, process design and economics.

JAMES E. DYER has been elected a vice president of Sinclair Oil Corp., according to an announcement by P. C. Spencer, president. Mr. Dyer joined Sinclair at the time of the original consolidation in 1916 coming from the Cudahy Refining Co. He is also a director and vice president in charge of transportation and distribution of Sinclair Refining Co.

DR. W. J. COPPOC has been promoted to associate director of research in The Texas Co.'s technical and research division with headquarters in the New York office. Dr. Charles E. Moser has been named to succeed Dr. Coppoc as assistant director of research at the company's research laboratories at Beacon, N. Y.

SELWYN EDDY has been appointed general sales manager for the midwest marketing area of Shell Oil Co. He is succeeded as manager of the firm's New York marketing division by B. C. Astrup, formerly assistant general sales manager in New York.

Lee J. Lobdell

Heads Lane-Wells in Canada

Lee J. Lobdell has been appointed vice president and manager of the Lane-Wells Canadian Co. He replaces C. F. Ludwig who has been made assistant division manager of the Pacific Coast division. Mr. Lobdell's responsibilities cover all phases of the company's Canadian activities. Mr. Lobdell, who has been with Lane-Wells for 14 years, gained his prominence in the Gulf Coast division where he has been superintendent of various districts of that area. He started with Lane-Wells as a crew member in the field.

Mr. Ludwig has been associated with the petroleum industry and its related services since 1933, having held various positions in the oil fields and in administrative capacities. He joined Lane-Wells in 1937 as a shooter and has been a superintendent of districts throughout the company. Before going to Canada in 1949 as vice president and manager of the Lane-Wells Canadian Co., he was Gulf Coast division sales manager.

New Halliburton Officers Elected

R. G. Kelly has been elected regional vice president of Halliburton Oil Well Cementing Co. and G. D. McEnroe has been named assistant treasurer. All other officers were reelected at the recent annual meeting.

Mr. Kelly supervises Halliburton's operations in California, West Texas, New Mexico, central Texas, Dallas and North Louisiana divisions. He joined the company in 1930 and has served as division manager and more recently as regional manager for the central region.

Mr. McEnroe became a tax accountant for Halliburton in 1940. Later he was made tax department supervisor. Both he and Mr. Kelly will continue to maintain headquarters at Duncan, Okla.

R. G. Kelly, left, and G. D. McEnroe

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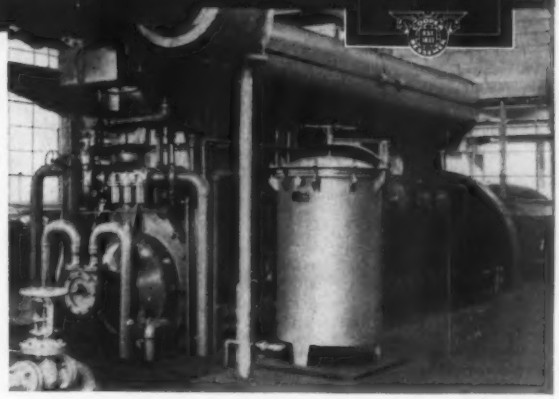
Another Example of Efficient Power at Lower Cost



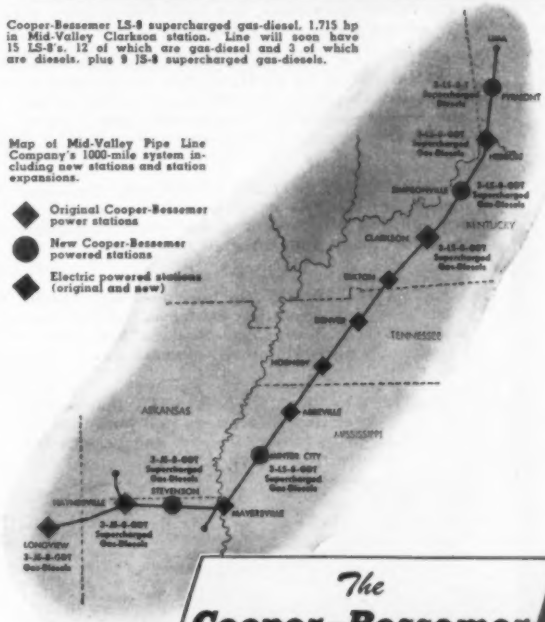
Cooper-Bessemer LS-8 supercharged gas-diesel, 1,715 hp in Mid-Valley Clarkson station. Line will soon have 15 LS-8's, 12 of which are gas-diesel and 3 of which are diesels, plus 9 JS-8 supercharged gas-diesels.

The capacity of the Mid-Valley Line, already one of the nation's largest oil line systems, will soon be expanded by the addition of 26,465 Cooper-Bessemer diesel and gas-diesel horsepower.

From the very beginning, the planning that went into the Mid-Valley Line took advantage of the latest developments in power and pipeline engineering to gain optimum operating economy. And, since Mid-Valley has had experience with their original Cooper-Bessemer Gas-Diesels, there's plenty of proof that these modern, smooth-running engines have what it takes, while considerably bettering their attractive guarantees.

The Mid-Valley Line's latest Cooper-Bessemers will power four new booster stations, and will increase the power in each of the four original engine-driven stations. This calls for five JS-8 supercharged Gas Diesels, eight LS-8 supercharged Gas-Diesels and three LS-8 supercharged diesels. In addition, the four JS-8 atmospheric engines originally installed in the Longview and Haynesville stations are being converted to supercharged gas-diesel operation. Thus all engines, both new and old, will be supercharged for peak economy, peak output throughout the system.

Like Mid-Valley, you too stand to gain plenty with dependable, highly efficient Cooper-Bessemers. You just can't do better!



Map of Mid-Valley Pipe Line Company's 1000-mile system including new stations and station expansions.

The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York, N. Y. Washington, D. C. Bradford, Penna. Parkersburg, W. Va.
San Francisco, Calif. Houston, Dallas, Greggton, Pampa and
Odessa, Texas Seattle, Wash. Tulsa, Okla. Shreveport, La.
St. Louis, Mo. Los Angeles, Calif. Chicago, Illinois Caracas, Venezuela

Italy Frames New Laws

(Continued from page 75)

the penalty is three to 10 years.

This project of law has excited lively interest in Italy, and also much criticism, especially the provision for reversion of the property to the state at the end of the concession without ample provision for amortization. The provisions for occupation of "the zone on which the conduit and accessory works are constructed" are loosely drawn, as is the provision giving right of access for surveying. The zone which the line may occupy is undefined, allowing conflict between property owner and concessionaire. The clause conferring "exclusive rights" seems open to an interpretation that would allow duplication of facilities in a commune.

CHESTER L. DOYLE has been advanced to assistant chief petroleum engineer in the exploration department of the General Petroleum Corp. His headquarters will be in company offices at Vernon, Calif. Mr. Doyle came to General Petroleum in 1939 upon his graduation from the University of California. He has since worked in company offices at Wilmington, Bakersfield and Fresno. His most recent position was senior petroleum engineer in the company's San Joaquin offices.

J. E. SWEARINGEN has been appointed general manager of production of the Standard Oil Co. (Ind.). He has been a director and assistant to the executive vice president of Stanolind Oil and Gas Co. at Tulsa. Mr. Swearingen joined Standard in 1939 as a chemical engineer. He was transferred in 1947 to Stanolind Oil and Gas Co., and served as assistant to the vice president in charge of operations, manager of the central division and director.

DR. STEPHEN S. HUBARD has been promoted to manager of research of the Davison Chemical Corp. Prior to joining Davison in 1944, Dr. Hubard had been active in teaching and chemical research.

HARRY W. McHOSE has joined the staff of the department of information of the American Petroleum Institute as editorial director, succeeding Joseph H. Mader, resigned. Mr. McHose has had extensive experience in public relations between industry and the public and will be in charge of preparation of the department's informational booklets, leaflets, pamphlets and other materials.

M. O. JOHNSON has been made assistant manager of the supply and transportation department of Phillips Petroleum Co., J. L. Kyser succeeding him as coordinator. Mr. Johnson also has been elected executive vice president of Phillips Pipe Line Co. J. W. Boyd became vice president in charge of operations of the products pipe line division and W. H. Wallace vice president in charge of the crude oil pipe line division.

K. V. SCHROEDER of Beaumont, Texas, has been appointed manager of Sun Oil Co.'s land department in the Gulf Coast division. Mr. Schroeder first joined Sun in 1936, working as a roustabout in various fields until his transfer to the geological department in 1937. He will continue in his present position as chief geologist assisted by Herbert Parker, who has been with Sun since 1937 in the seismograph and geological departments.

CECIL V. HAGEN of Houston, Texas, has been elected president of Canada Southern Oils, Ltd., company formed recently to take over the Canadian and Ecuadorian interests of Pancoastal Oil Co., Calgary, Alberta.

L. J. KILLIAN, who has been superintending Bechtel construction projects in Arabia since 1947, was appointed a vice president of International Bechtel, Inc., at a recent meeting of the board of directors. Mr. Killian returned to Arabia in August to continue as Bechtel's project manager for Aramco at Dhahran.

HARRY E. ESTES, sales co-ordinator of the A-1 Bit & Tool Co., Houston, has been elected executive secretary of the NOMADS National Board of Regents. Mr. Estes received the unanimous approval of the board to succeed Harold M. Cosgrove of Tulsa, retiring due to illness. Mr. Estes has been executive secretary of the Houston chapter of NOMADS for the past eight years, and will continue in that capacity.

MAYNARD I. LANDA has been appointed associate petroleum economics coordinator of Cities Service Co. He has been manager of the petroleum economics and statistics department since 1941. Mr. Landa joined Cities Service as a junior engineer in 1919. In 1923 he became assistant to the manager of oil production and in 1925 he was transferred to the New York office.

PROFESSOR E. BARBARII, of the University of Tulsa, Okla., has been named an advisor to Petroleos Mexicanos. He will be assigned to the Mexican oil agency's development section headed by A. Barnetche.

FULTON C. FIGUEROA has been appointed office and field manager for the Isthmus Development Company's Mexican operation in Coatzacoalcos, in the State of Veracruz.

SAM SCHOELMAN, assistant manager of Petroleos Mexicanos' New York office, has been transferred to the Mexican Embassy in Washington, D.C., where he will attempt to expedite official approval for supplies needed by the government oil agency. Mr. Schoelman held the same job during World War II.

CAPT. BART W. GILLESPIE, former manager of the Mexican-American Independent Oil Co., revealed he will soon leave Mexico on a business trip to Los Angeles.

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g, cutting, pull-
ing, backing off, recovering junk, or any of a dozen similar jobs—
put Bowen Fishing Tools to work on your rig!
Bowen—through more than 30 years of engineering new tool designs, new improvements—has developed a complete line of fishing tools that help you speed the work . . . reduce the risk . . . and cut the cost on all your fishing operations. For your fishing jobs, get the important extra advantages of such features as . . .
A STRAIGHT-PULL FISHING JAR that requires no dangerous torque for operations, yet is fully adjustable for intensity of blow while in the hole, is faster in operation, has no delicate mechanisms. . . .
A SIMPLE, SAFE ROTARY SPEAR with a releasing mechanism that has never been known to fail on any job and with operating and construction features that make it ideal for all spear work. . . .
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EXPORT REPRESENTATIVE: VAL R. WITTICH, JR.

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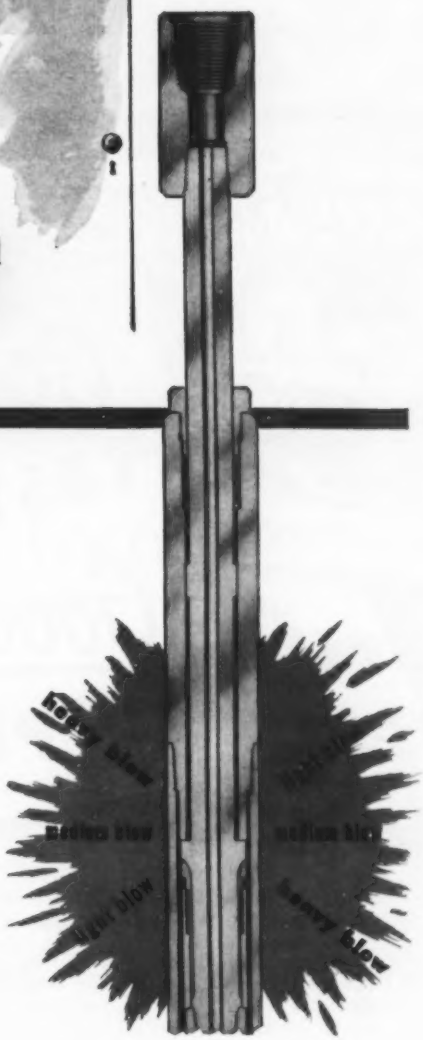
for the job at hand

Jarring Jerry



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A Jar that hits any desired blow, at any time, to meet any condition—without pulling out of the hole.

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"Exclusive Export Sales"

World-Wide Rise in Petroleum Demand Stimulates Exploration and Drilling

(Continued from page 47)

company, holds exploration rights covering 250,000 square miles in this area. Following Ampol's preliminary geological reconnaisance, it has been joined by California-Texas Oil Co. in plans for additional surveys and the drilling of a deep test estimated to involve an expenditure of four to five million dollars. The Australian government is sending a seismic party to make surveys in the northwestern section of the continent. Meanwhile other private interests are continuing exploration and test drilling in eastern and southern areas.

In Japan an energetic campaign has been carried on under the supervision of American headquarters, designed to extend existing fields and to locate new reserves. Close to 160 wells were drilled during the past year resulting in a substantial addition to oil and gas production and enlargement of reserves.

Japanese production rose 5.1 percent in 1950 to 5,660 b/d and the upward trend is continuing this year. Most of the increase is the result of deeper drilling in the Yabase field which now is producing more than half of the national output. New reserves proved up by deep drilling by Imperial Oil Co. at Yabase were estimated at 8.6 million barrels. The Japanese industry drilled 85 wells in its search for oil in 1950 of which 51 were producers and 34 dry. Sixty-nine producing gas wells also were drilled. No new fields were discovered. Reserves on Jan. 1, 1951 are estimated at 26.3 million barrels. Exploration survey work was active in 1950 with 177.4 party months of all types reported. Most of the work was by geological crews although 18.9 party months were reported by seismic reflection crews, 20 months gravity meter and 17 months by geochemical crews.

The overall picture of the petroleum industry in the international field is one of mounting activity in the search for oil and of a steadily rising trend in production in response to the rapid growth in demand which is putting increasing pressure on existing facilities.

Latin America bought $2,907,200,000 worth of U. S. goods in 1950—an all-time high mark.

Number 1 on the list was Mexico, with purchases from the U. S. totalling more than $515,700,000.

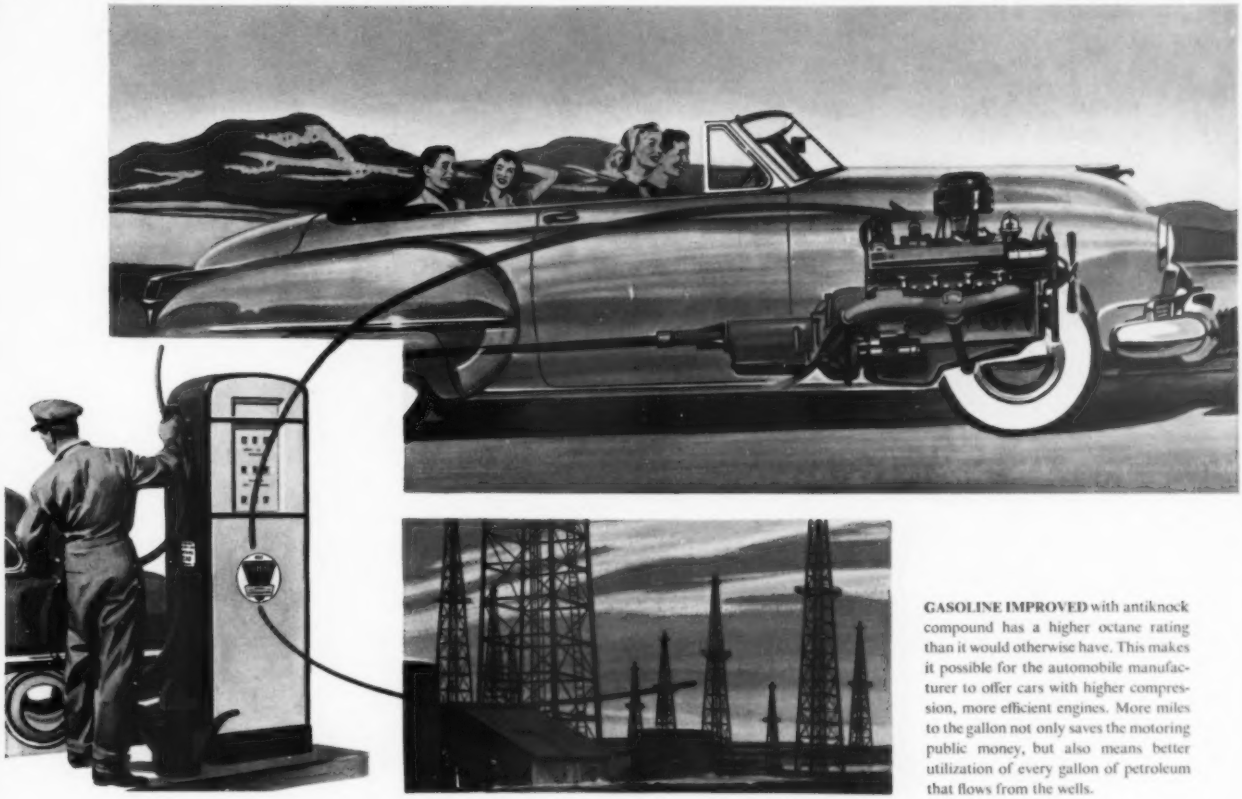
Surprising? Not to those who've been watching the rapid pace of progress below the Rio Grande.

And, Mexico is not only a valued *customer* of the U. S.—it's a valued *supplier* too: of basic, indispensable materials.

Key to this forward movement is the emphasis on a *well-rounded* economy — a buildup of *all phases* of the Republic's potential wealth: agriculture, mining, manufacturing, transportation, commerce.

All of this calls for oil — millions upon millions of barrels of it — and Petroleos Mexicanos supplies it promptly and abundantly — to keep up the tempo of progress . . . for today . . . and *tomorrow*.

PETROLEOS MEXICANOS MEXICAN PETROLEUM ADMINISTRATION



GASOLINE IMPROVED with antiknock compound has a higher octane rating than it would otherwise have. This makes it possible for the automobile manufacturer to offer cars with higher compression, more efficient engines. More miles to the gallon not only saves the motoring public money, but also means better utilization of every gallon of petroleum that flows from the wells.

ANTIKNOCK COMPOUND

A $600,000,000 saving on the nation's gasoline bill is made possible by the widespread use of antiknock compounds in gasoline

No matter what kind of gasoline you put in your car, the gauge on the dashboard will move from "Empty" to "Full." But no gas gauge can give you any idea of how much *power* you have purchased.

For example: Suppose twenty gallons of gasoline "A" would drive a car an even 300 miles. But gasoline "B"—because its superior quality permitted a more efficient engine—would drive a car 330 miles. Then wouldn't the better gasoline be worth more to you, even though the quantity were the same?

Of course, you might not apply the extra quality of gasoline "B" solely to increasing mileage. You might prefer it to drive a heavier car, carry a bigger load, or get better performance.

The addition of antiknock compound to gasoline by more than 200 oil companies has produced a result very much like this.

Enough antiknock fluid is used, on the average, to step up antiknock quality by about ten octane numbers. This has permitted automobile manufacturers for quite a few years now to equip their cars with engines of higher and higher compression ratios. These engines are considerably more efficient—and a conservative estimate indicates that they lop about 10% off the nation's annual gasoline consumption. This economy not only represents a saving of $600,000,000, but also conserves petroleum equivalent to the output of about five hundred oil wells, each producing a thousand barrels a day.

Because modern gasoline is improved both with antiknock fluid and through the use of advanced refining methods, it is one of today's outstanding bargains. *Two* gallons of today's gasoline will do the work of *three* gallons of 1925 gasoline—yet the price per gallon, excluding taxes, is about the same.

ETHYL CORPORATION, New York 17, N. Y.
Manufacturers of "Ethyl" antiknock compound

BY ANY YARDSTICK... CEMENTING PRICES ARE LOW

WAGES: The Howco cementer is a carefully selected technician equipped by training and experience to handle any problem that a wide variety of conditions may present.

He operates equipment worth more than $50,000, and shares in the guardianship of a reputation that cannot be appraised in terms of dollars.

His pay check today is 70% larger than it was in 1924. The average cost to the customer of the cementing service he performs is actually *less.*

By any yardstick, Halliburton cementing prices are low.

Erle P. Halliburton

Chairman of the Company
HALLIBURTON OIL WELL CEMENTING CO.
Duncan, Oklahoma

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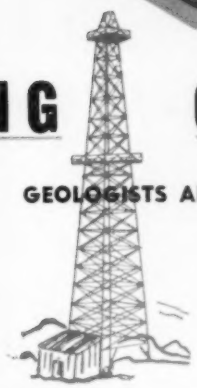
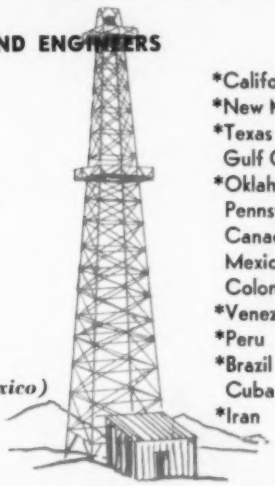
GEOLOGISTS AND ENGINEERS





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*Texas
Gulf Coast
*Oklahoma
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Cuba
*Iran

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TRECO DOES IT AGAIN!

The McMurrey Refinery has many outstanding features that are worthy of the consideration of anyone contemplating new plant construction. Refinery Engineering Company will supply complete details.

1. EARLY COMPLETION DATE

Plant was "on stream" in less than a year after the contract was signed.

2. LOW LABOR COST

Total field construction labor was appreciably under the estimate of the cost of the project.

3. SAFETY AND EFFICIENCY

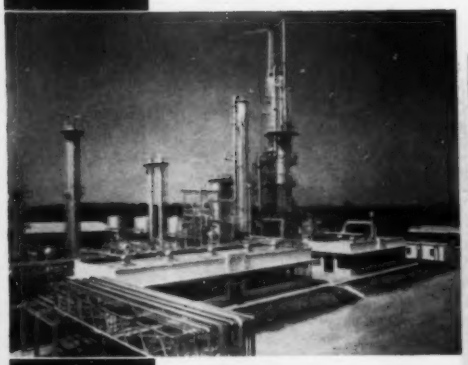
Every known safety and efficiency feature, with respect to ease of operation, was kept in mind throughout the design and construction of the plant.

4. SPEED OF OPERATION

The complete unit, including the Poly plant, was placed "on stream" in less than 24 hours after starting the raw oil charge pumps.

Confirmation of the above may be had by placing a telephone call to Mr. M. H. McMurrey, President, McMurrey Refining Company, Tyler, Texas.

NEW McMURREY REFINERY, TYLER, TEXAS



Mr. M. H. McMurrey, President, McMurrey Refining Company, is a well-known East Texas Industrialist and Rancher. The progressive thinking and planning of Mr. McMurrey and the splendid cooperation of his staff made possible the completion of this refinery in record time.

Call, wire or write for a discussion of your refining problems and their solution, without obligation. Our airplanes make us neighbors.

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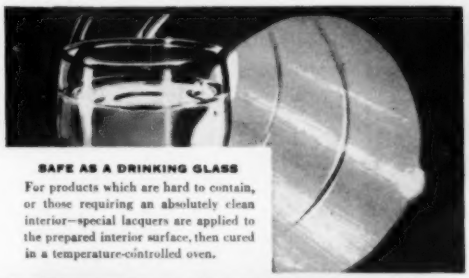

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For products which are hard to contain, or those requiring an absolutely clean interior—special lacquers are applied to the prepared interior surface, then cured in a temperature-controlled oven.

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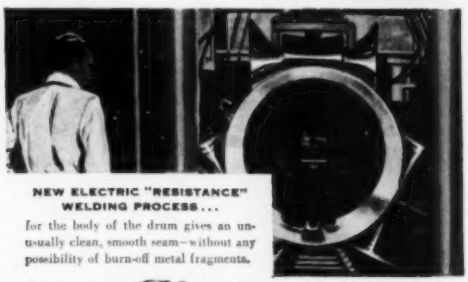
applies the base coat to the steel surface, assuring positive adhesion for utmost resistance against weather and handling.



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for the body of the drum gives an unusually clean, smooth seam—without any possibility of burn-off metal fragments.

After many years of research, the Rheem Manufacturing Company, world's largest maker of steel shipping containers, is proud to have developed the Rheemcote Process in this, its 25th year of service to industry.

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SWIFT AND CO.
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UNION OIL CO. OF CALIFORNIA
UTAH OIL REFINING CO.
WASATCH OIL CO.
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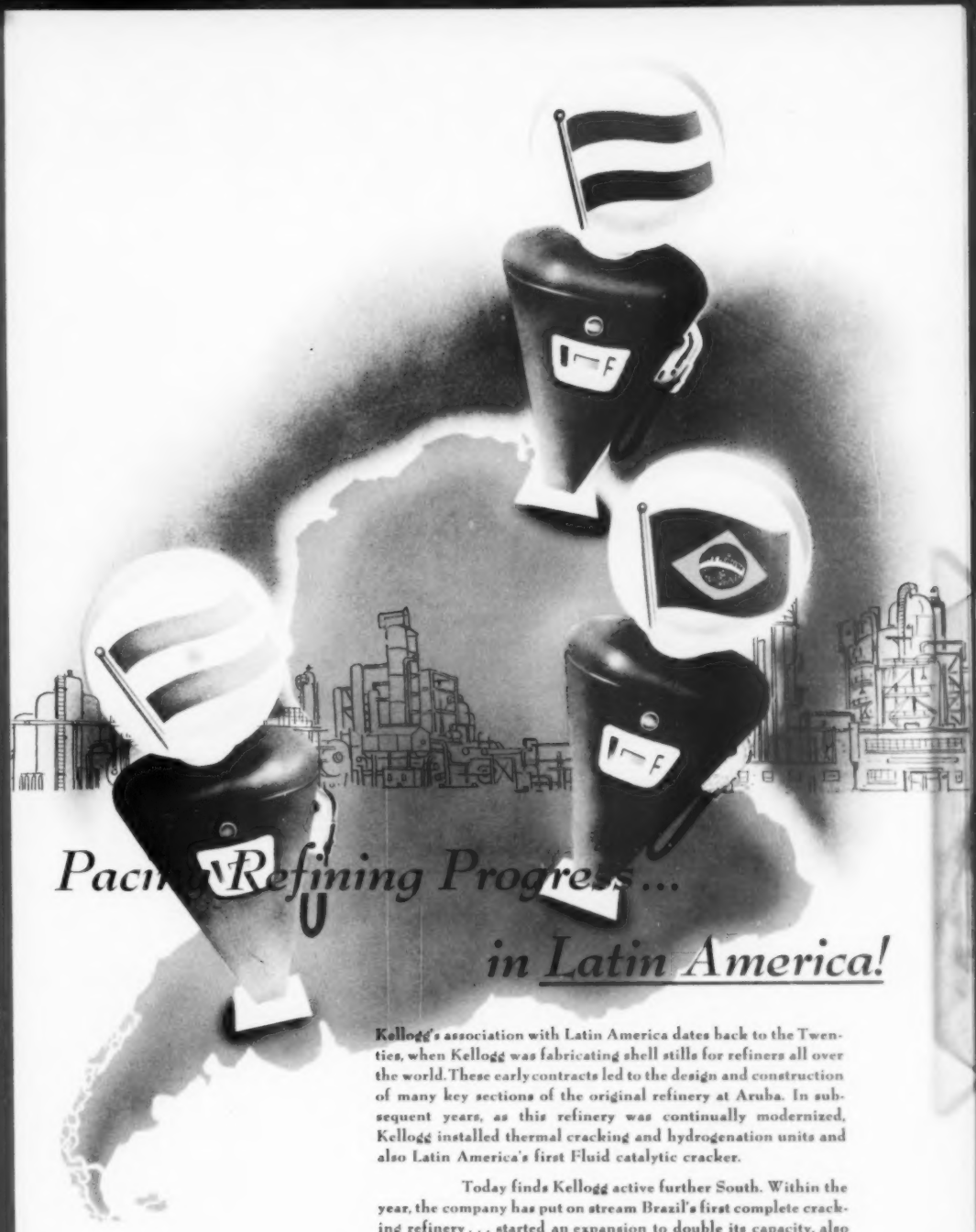

Pacing Refining Progress ... in Latin America!

Kellogg's association with Latin America dates back to the Twenties, when Kellogg was fabricating shell stills for refiners all over the world. These early contracts led to the design and construction of many key sections of the original refinery at Aruba. In subsequent years, as this refinery was continually modernized, Kellogg installed thermal cracking and hydrogenation units and also Latin America's first Fluid catalytic cracker.

Today finds Kellogg active further South. Within the year, the company has put on stream Brazil's first complete cracking refinery . . . started an expansion to double its capacity, also adding cat poly and LPG facilities . . . and initiated work on a 10,000 BPD complete refinery at Rio de Janeiro.

Concurrently, in the Argentine, Kellogg has placed a complete toluene plant on stream at Campana and started construction on a 30,000 BPD refinery at La Plata. This project includes the most advanced high-octane processes—Fluid catalytic cracking, catalytic polymerization, and alkylation—as well as topping, vacuum flashing and delayed coking.

THE M. W. KELLOGG COMPANY

A SUBSIDIARY OF PULLMAN INCORPORATED

for fifty years an integral part of processing history

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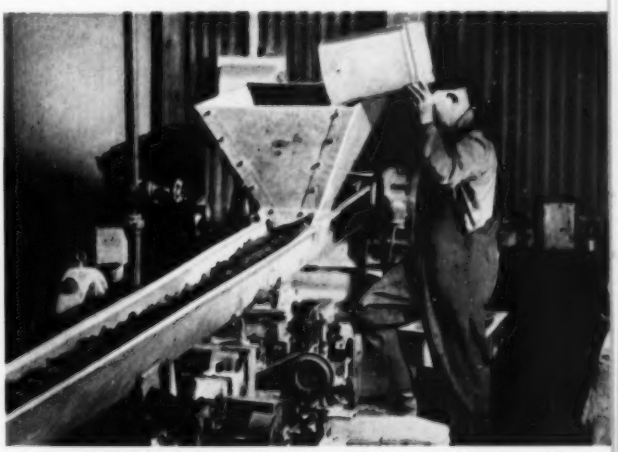
Portrait at

This year is Kellogg's fiftieth of service to industry. At this time naturally, as a group of men—known collectively to the modern business world as The M. W. Kellogg Company—we can think back nostalgically. We can remember the chimney stacks

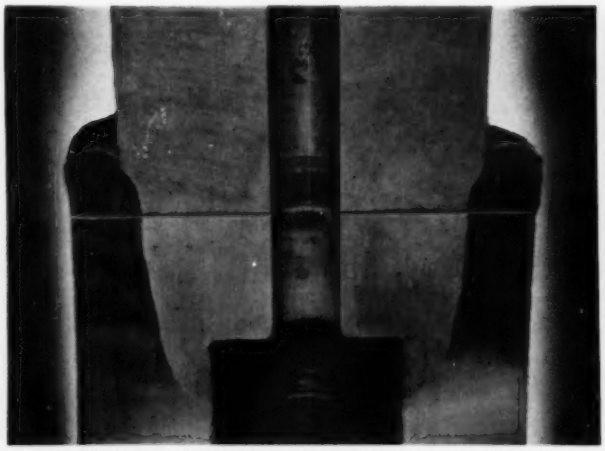
Meeting the Toughest "Specs"...

In previous issues of this magazine, camera "portraits" of M. W. Kellogg today have highlighted the major aspects of Kellogg's broad research, development, engineering and procurement activities.

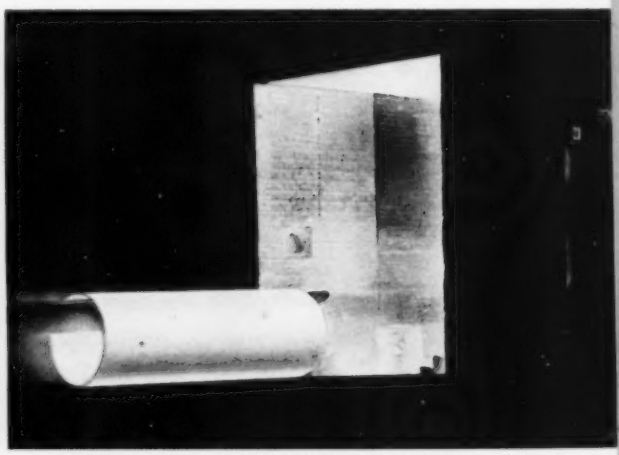
This month, Kellogg's manufacturing operations, largely centered in Jersey City, New Jersey, come within the lens. Some of these operations are continuations of various phases of the original metal fabricating business from which the modern company stemmed. Others had their inception as outgrowths of Kellogg's research and development activities... when the company undertook the manufacture of new equipment and materials which were not commercially available but which were required to meet improved engineering specifications.



1. *WILLINGNESS TO PRODUCE SPECIALTY ITEMS* is readily apparent in this catalyst manufacturing phase of the company's operations. When cat poly and hydroforming were being introduced into commercial refining, there was no readily available source for the special catalysts desired. Consequently, Kellogg undertook their manufacture and, today, two plants in Jersey City continue to produce these specialized materials.



4. *FROM THE SAME MILL* came a special transition piece (test piece illustrated) which solved a problem in the design of 1050°F power piping installations. The piece is used to join two types of alloy piping with widely varying coefficients of thermal expansion. It is so cast that the analysis of each end matches that of the piping to which it is joined. The result: elimination of excessive weld stress at elevated temperatures.



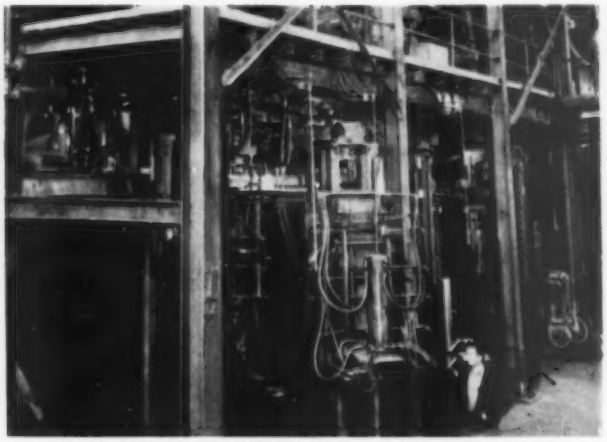
5. *TOWERS, VESSELS, EXCHANGERS* and piping, however, are the principal products of the shops. Facilities are complete, from plate forming to precision machining. The shops are employed in three major ways . . . to build prototypes of Kellogg-developed equipment; as a prime supplier on refinery construction contracts; and to manufacture custom-made equipment for direct sale to the process industries.

Fifty... no 8

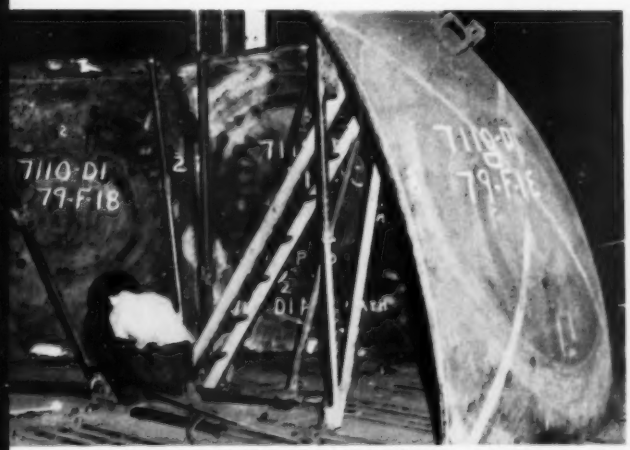
we built in 1901 . . . the first crude vessels for oil refiners in the 'teens . . . our first combination unit. The forty-odd Fluid cat crackers built in these years. But, after all, The M. W. Kellogg Company is only a factor as it is able to serve industry today. For that reason, we are presenting this series of monthly camera studies which document our belief that a truly integrated organization can better serve industry to achieve greater earning power. This is No. 8 in the series.

KELLOGG
1901-1951
50th Anniversary

2. ***A SIMILAR SITUATION*** placed Kellogg in the refractories and refractory products business. These products play so large a part in most industrial processing projects that years ago the company developed materials specifically suited for process plant applications. Currently, these materials are made to Kellogg specifications and sold under such trade names as Ignisite, Kel-crete, Kel-block and Thur-Ma-Lox.



3. ***PROBABLY THE LAST THING*** you would expect to find at Kellogg would be a steel mill. Yet, this unique electric steel plant at Jersey City, outgrowth of Kellogg metallurgical research, is continuously producing alloy ingots with exceptional mechanical properties. The process assures a constant analysis throughout the cross-section of the ingot which explains why jet turbine manufacturers are steady customers for this steel.



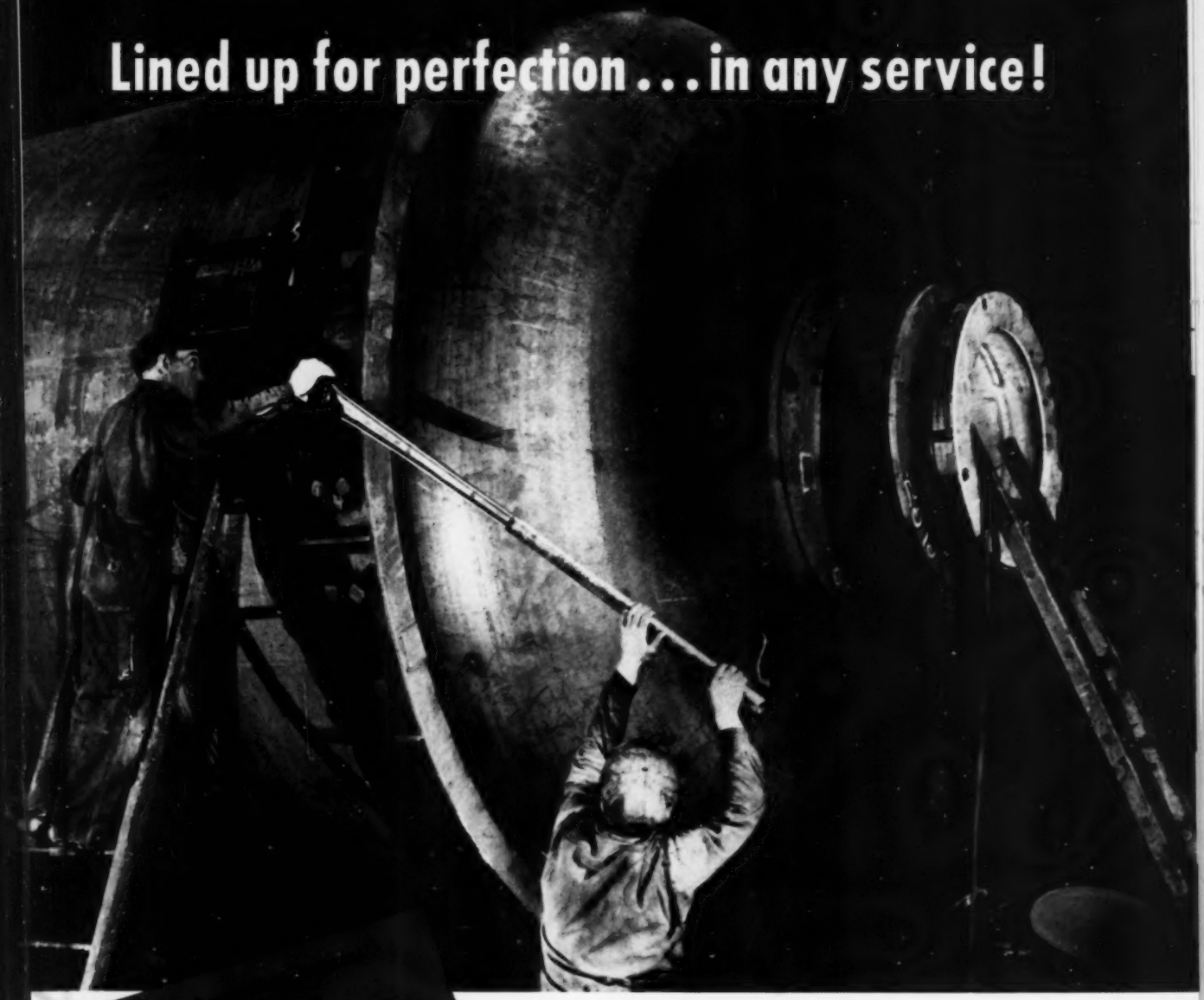
6. ***LARGE PROCESS VESSELS*** call for different techniques because it is frequently impossible to ship them completely assembled over inland rail routes. Kellogg has developed two solutions to this problem. First by floating vessels to their final locations over inland waterways. Second, and more recently, by knockdown fabrication of carefully matched segments in the shop as shown in the accompanying picture.

7. ***THE IMPORTANT ROLE OF WELDING*** in the fabrication of equipment is underlined by the fact that the company maintains a special *Welding and Welding Practices Research Group*. Since 1931, this group has been closely associated with such developments as continuous welding, inert gas welding and other techniques with the result that today Kellogg's equipment is among the most modern available.

NEXT MONTH

. . in the ninth of this series of camera studies of M. W. Kellogg today . . . you will glimpse a few of the specialized, and in many instances unique, techniques employed to improve the quality of manufactured products.

Lined up for perfection . . . in any service!



M. W. KELLOGG

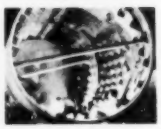
In digestors for pulp mills . . . special towers for fatty acid splitters . . . refinery vessels, large and small . . . in equipment for any processing task, Kellogg's accurate line-up techniques, preparatory to welding, pay off in peak operating performance and longer service life.

- Pressure Vessels
- Vacuum Vessels
- Fractionating Columns
- Drums and Shells
- Heat Exchangers
- Process Piping
- Hi-pressure—Hi-temp Power Piping
- Bends and Headers
- Giant One-Piece Bends
- Forged and Welded Fittings
- Radial Brick Chimneys

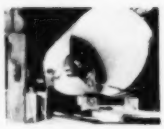
Continuing Study of behavior of metals under stress at high temperatures has produced valuable design data.

Shop Layout Craftsmen are fully experienced in vessel fabrication from nozzle positioning to "knockdown" fabrication for field assembly.

Extensive Facilities from forming of plate to final machining of precision surfaces permit complete fabrication under the same roof.



Special Welding Techniques and stress relieving methods assure equipment performance even under severest operating conditions.



Rigid Quality Control, devised by specialists, including chemical and micro analyses as well as mechanical and non-destructive testing.

NEWS FOR OPERATORS IN WESTERN CANADA!

The Canadian Kellogg Company Ltd. has established complete shop facilities for the fabrication of all types of piping at **EDMONTON**, Alberta. Inquire directly or through any Kellogg or Canadian Kellogg office.

The M. W. Kellogg Company *(A Subsidiary of Pullman Incorporated)* **New York, Jersey City, Los Angeles, Tulsa, Houston, Toronto, London, Paris**

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Modern industrial power distribution systems using G-E switchgear are applicable to any industrial plant or commercial building where you want proper voltage for top performance of equipment, an extremely flexible setup to take care of expanding or changing loads, adequate short circuit protection, safety to personnel, and low installation and maintenance costs. A complete system, using G-E switchgear, costs you less than a "piecemeal" makeshift affair.

General Electric 5-Kv Type MI-6 metal-clad switchgear consisting of one incoming-line breaker and four feeder breakers to handle 4160 volts.

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See your nearest General Electric representative for further information:

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INTERNATIONAL GENERAL ELECTRIC CO., INC.
New York, N. Y., U.S.A. Schenectady, N. Y., U.S.A.

Book Review

The Oil Record (1951), compiled under direction of Henry Ozanne; hard cover, 384 pages, tables and index; published by Petroleum Industry Projects, Washington, D. C.—$6.00.

The new 1951 edition of the Oil Record contains operating and financial information for the year 1950 on more than 300 American oil and natural gas companies, with detailed treatment of 115 companies. Information presented includes acreage holdings of the various companies, their drilling programs, production totals, refinery runs, transportation facilities, marketing records, and foreign operations, together with capitalization tallies, selected balance sheet data, and earning statement.

The book is expanded by 128 pages over the 1950 issue, and much of the new material is in tabular form for easy reference and comparison. The statistics generally are carried over a three-year period. A feature is the company comparison tables, showing rank order of many companies in respect to crude oil reserves, production, refinery throughput, and number of wells drilled. Various indices are developed from the reported data, such as dry holes as a percent of wells drilled, production as a percent of refinery runs, net worth, and property plant and equipment value per share of common stock. Copies are available at $6.00 through the book department of WORLD PETROLEUM, 2 West 45th Street, New York 19.

Heads West Coast Sales

Sheldon T. Dahl has been named West Coast manager of American Cyanamid Co.'s industrial chemical division and plastics and resins division. Herbert G. Pratt was promoted to manager of the San Francisco office of the industrial chemicals division. Mr. Pratt joined the company as a member of its sales staff in Los Angeles when the S. T. Dahl Co., a sales and distribution firm of which he was a partner, was acquired by Cyanamid in 1948.

Herbert E. Fisher

Pipe Line Engineering Firm

CRC Engineering Co., a new organization to provide complete engineering design services for crude, gas and products pipe lines including economic studies of proposed projects, has been formed at Houston, Texas. Partners in the firm are H. E. (Herb) Fisher, A. S. Crutcher, Gene Rolfs and Jim Cummings. Mr. Fisher, who recently resigned as chief engineer of Standard Oil Co. (Ind.) has been associated with the engineering design and construction of pipe lines for 20 years. Messrs. Crutcher, Rolfs and Cummings have operated for more than 18 years in the development, manufacture and supply of equipment for the pipe line industry.

BOB ALDRICH, Mexican manager of the Westby Geophysical Co., has returned to Mexico after a business trip to Tulsa, Oklahoma.

To Enlarge Australian Refinery

Vacuum Oil Co. Pty., Ltd., will increase the capacity of its Altona, Australia, refinery to 14,000 barrels daily according to an announcement by Standard-Vacuum Oil Co. Present plant in the Melbourne district is a lube and asphalt refinery with a capacity of 2,000 b/d.

The new project will include a catalytic cracking plant with distillation facilities for production of motor gasoline, jet fuels, kerosine diesel fuel and residuals. Middle East crude will be processed. The $17 million plant will enlarge Australia's national refining capacity by 40 percent. It will bring Standard-Vacuum's total refining capacity in South Africa, Indonesia and Australia to more than 100,000 b/d.

Steel For Overseas Use

The Defense Production Administration of the United States on August 15 authorized the allocation to American companies for operations abroad of 85,100 tons of oil country tubular goods. This is for shipment during the fourth quarter of the current year and is in addition to the 144,000 tons of steel previously assigned for distribution during this period through ECA and the Office of International Trade. The action was taken with approval of the National Production Authority and permits the pooling of overseas resources as needed to offset the loss of Iranian supplies.

Lane-Wells Transfers Hancock

Ray A. Hancock, previously assistant Pacific Coast division manager of the Lane-Wells Co., has been transferred to Oklahoma City as assistant Mid-Continent division manager. In his 13 years with the company Mr. Hancock has held varying managerial positions. He was hired as Pacific Coast division operating superintendent and later became sales manager and finally assistant manager of that division. During 1950, he was subdistrict superintendent at Odessa, Texas.

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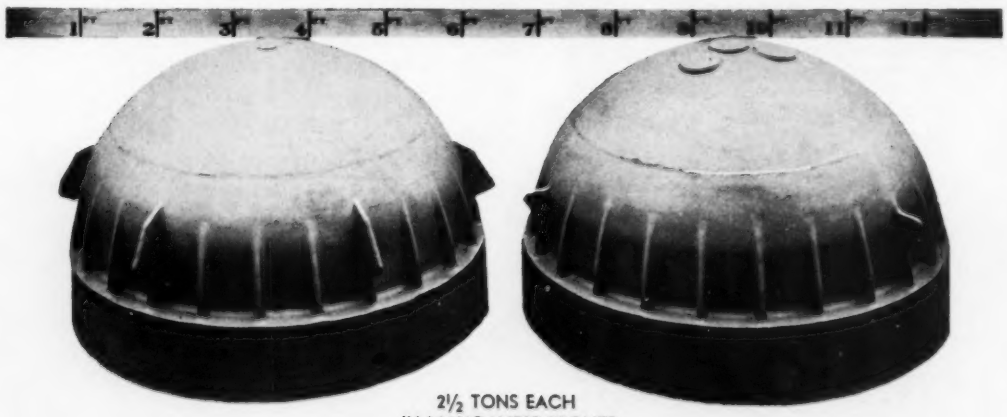

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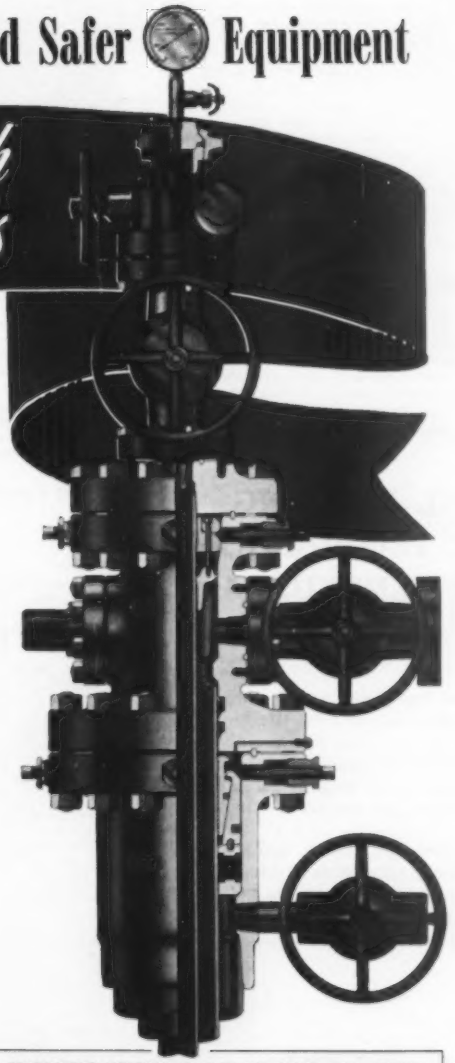
O-C-T pioneered high pressure controls



During the years O-C-T has served the oil industry, we have felt a responsibility to be ready with equipment to meet **future needs** as well as dependable equipment to meet the every-day needs at hand.

As a result of this program of continuous research and development, Oil Center Tool Company gave the industry its first 10,000 lb. tree . . . **and** its first 15,000 lb. test tree.

With the expanded search for new and deeper oil reservoirs, pressures and depths will be encountered which will place other new demands on equipment. In anticipation of these future needs, O-C-T has again stepped up its program of research and development. So, when stronger, higher pressure controls are needed, O-C-T will have the equipment required for your operations.

On your next well . . . on wells of any depth or pressure . . . take advantage of the added strength, safety, convenience and flexibility provided by dependable O-C-T products. They have been engineered and manufactured to help you drill for and produce oil with economy and greater safety. Ask your O-C-T Representative or write for details.

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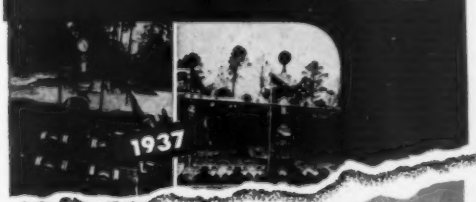
Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston 1, Texas.

When the industry demanded 10,000* TEST PRESSURE EQUIPMENT, O-C-T *was first to provide it — at Cotton Valley, for example*

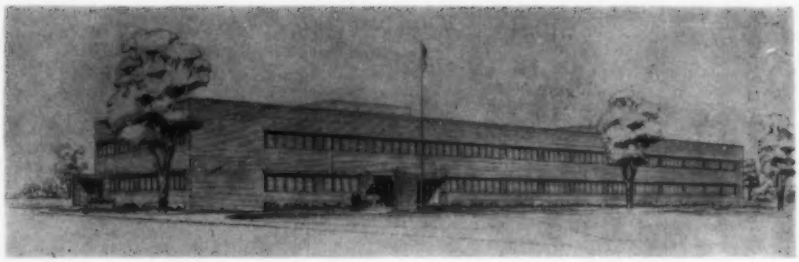


O-C-T PRODUCTS HAVE PROVED DEPENDABLE ON THE WORLD'S DEEPEST WELL—ON THE WORLD'S HIGHEST PRESSURE WELL

CROWDS VIEW O-C-T 15,000 LB. TEST CHRISTMAS TREE—WORLD'S FIRST!

UOP to Build New General Office Building at Des Plaines, Ill.

Universal Oil Products Co., Chicago, will build a general office building at Des Plaines, Ill., a Chicago suburb, according to an announcement by David W. Harris, president. In his statement Mr. Harris said that the company has acquired a 54-acre tract which is sufficiently large to permit the addition of a laboratory, pilot plant, and other facilities at a later date. The building, on which construction will start immediately, will have two stories and a basement measuring 360 feet in length and 75 feet in width and will be of brick and concrete construction. When completed it will accommodate approximately 350 persons. Departments included, and now located in Chicago's loop, are development, engineering, design, service, and administration. Quarters will also be provided for the company's construction subsidiary, Procon, Inc.



S. O. Indiana Research Promotions

Standard Oil Co. (Ind.) has announced five promotions on its research staff. The members promoted and their new positions are: R. F. Marschner, senior research associate; B. L. Evering, research associate; A. P. Lien, section leader; and D. R. Carmody and C. E. Johnson, group leaders. All are located at Whiting, Ind.

OIL DRILLING AND PRODUCTION IN VENEZUELA

A new weekly scout service giving oil drilling and production information for the Latin American oil countries: Venezuela, Trinidad, Colombia, Peru, Ecuador, Bolivia, Brasil, Chile and Mexico.

Data on: wells, drilling, spudded, producing, status of wells, completions, rigs operating, footage drilled; oil production; by operators, fields and countries.

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Earnings Set Record

Oil company earnings in the first half of 1951 have established a new record in spite of largely increased federal income tax payments. Net reported by 42 corporations totaled $1,106,554,000, an increase of 43.3 percent over the $772,508,000 earned by the same companies in the first half of 1950.

Union Oil Co. reported an increase in net earnings of 150 percent, from $5.5 million in 1950 to $13.5 million this year. Richfield Oil Corp. enjoyed an increase of 76.5 percent from $8.5 million last year to $14.9 million. Socony-Vacuum income was up 69 percent, Humble 68 percent, The Texas Co. 59.5 percent and New Jersey Standard 57 percent. Comparisons of earnings for 42 companies are shown below.

Oil Company First Half Earnings

	Net Income (Thousands of Dollars) 1951	1950	Per Share On Common 1951	1950
Amerada (a)	$3,838	$3,400	$1.22	$1.08
Anderson-Prichard	2,601	2,426	3.20	2.98
Ashland Oil	9,186	6,357	3.90	3.28
Atlantic Rfg.	20,723	17,663	5.60	6.27
Barber Oil Corp.	1,555	495	4.12	1.31
Continental	22,033	17,104	2.27	1.77
Crown Central	973	442	—	—
Derby Oil	610	505	1.51	1.25
Gulf	63,319	50,621	2.79	2.23
Houston	3,488	2,852	3.17	2.60
Humble Oil & R.	89,314	53,857	4.97	2.99
Lion	5,744	7,148	2.45	3.05
Maracaibo Oil	392	115	.88	.26
Mid-Continent	8,976	5,980	4.83	3.22
Ohio Oil	19,777	17,541	3.01	2.67
Pac. Western	5,751	4,233	1.21	.93
Phillips	32,003	22,040	2.46	1.82
Pan Am Pet. & Trans.	11,703	8,751	2.48	1.85
Plymouth	4,891	3,614	4.06	3.01
Pure	15,154	12,516	3.53	2.87
Quaker State	1,108	1,236	1.19	1.33
Richfield	14,997	8,478	3.75	2.12
Shell	46,495	39,479	3.45	2.93
Sinclair	38,108	28,641	3.15	2.37
Skelly	14,405	11,674	5.51	4.46
Socony-Vacuum	76,000	45,000	2.39	1.41
South Penn.	4,267	4,263	2.57	2.10
Standard, Cal.	84,918	60,407	2.96	2.11
Standard, Ind.	71,069	52,498	4.64	3.43
Standard, Ky.	5,034	5,932	1.93	2.23
Standard, N. J.	249,000	159,000	4.11	2.63
Standard, Ohio	8,236	7,313	2.14	1.92
Sun Oil	22,712	13,151	3.77	2.39
Sunray	12,617	12,332	1.28	—
Superior Oil (b)	11,276	5,475	26.66	12.94
Texas	86,507	54,310	3.14	1.97
Texas, Gulf	1,473	1,339	1.33	1.24
Texas Pac. C & O	2,380	2,732	1.91	1.54
Tide Water	17,223	14,734	2.69	2.25
Union	13,480	5,394	2.47	.94
Venezuelan Pet.	1,770	1,117	.44	.28
Wilcox	448	343	1.60	1.22
TOTAL	$1,106,554	$772,508		
Increase	43.3%			

(a) 3 months
(b) 9 months

Garber Heads Hinderliter

L. L. Garber, vice president, H. K. Porter Co. Inc., has been appointed general manager of the company's Hinderliter Tool Co. division, Tulsa, Okla. He formerly was general manager of American-Fort Pitt Spring division.

FPC Decision Forecasts New Policy

The four-to-one ruling of the Federal Power Commission against taking jurisdiction over the natural gas operations of Phillips Petroleum Co. assumes the proportions of a major victory for the oil and gas interests of the United States. It has been followed by a proposal of Congressional action to eliminate the authority which the Commission has attempted to exercise over intrastate gathering lines of gas companies. While it had been expected that the Phillips case would be appealed to the Supreme Court with a resultant long period of uncertainty pending its decision the Commission appears ready now to drop its claim.

Attempts of the Commission to extend its authority over intrastate operations and prices on the ground that these affected interstate rates has been hotly fought by the industry but without any clearcut success heretofore. The ruling in the Phillips case with a line-up of four members including the chairman against a single dissenter and the decision against appeal indicates a definite shift in attitude. Among members of the industry it is regarded as accomplishing the same effect as would have followed enactment of the Kerr-Harris natural gas bill of last year which was vetoed by the President.

New Minnesota Refinery

Plans for construction of a modern, $7 million oil refinery near the cities of Duluth, Minn. and Superior, Wis., have been announced by International Refineries, Inc. of Minneapolis, Minn. H. M. Baskerville, president of the corporation, said that the refinery, to be located in Carlton County, Minn., will have a capacity of 11,500 barrels a day. It will adjoin the Interprovincial Pipe Line which runs from Edmonton, Alberta, Canada, to Superior, Wis.

Entire output of the refinery has been sold to Western Oil & Fuel Co., of Minneapolis, of which Mr. Baskerville is also president. The company is one of the largest independent distributor-marketers of petroleum products in the northwest and has serviced the area for many years. The project will be financed by the public sale of securities. A combination unit embodying a model IV fluid catalytic cracking unit will be erected. The Lummus Co. is the contractor. The plant is designed and licensed by Standard Oil Development Co.

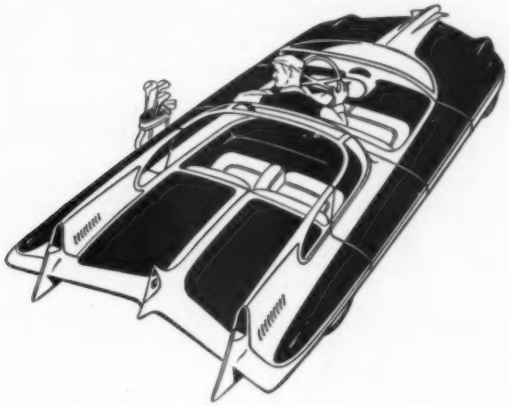
New Furfural Plant

Quaker Oats Co. is building a furfural plant at Omaha, Neb., to meet the expanded demand for furfural as a solvent in the refining of petroleum and reactant in resin manufacturing. Furfural is also required for the production of synthetic rubber. The plant is scheduled for completion in October.

Gas Detector

A new type semi-portable gas detector for hydrocarbon shows in drilling wells has been placed on the market by Atlas Exploration Co., Houston. Called Rigtector, the instrument is designed to sound a siren alarm when hydrocarbon vapors come from the well head. No flow pump or air aspirator bulb is required, but a simple swage is inserted between the well head and the shale shaker. The alarm indicator may be set for any predetermined percentage.

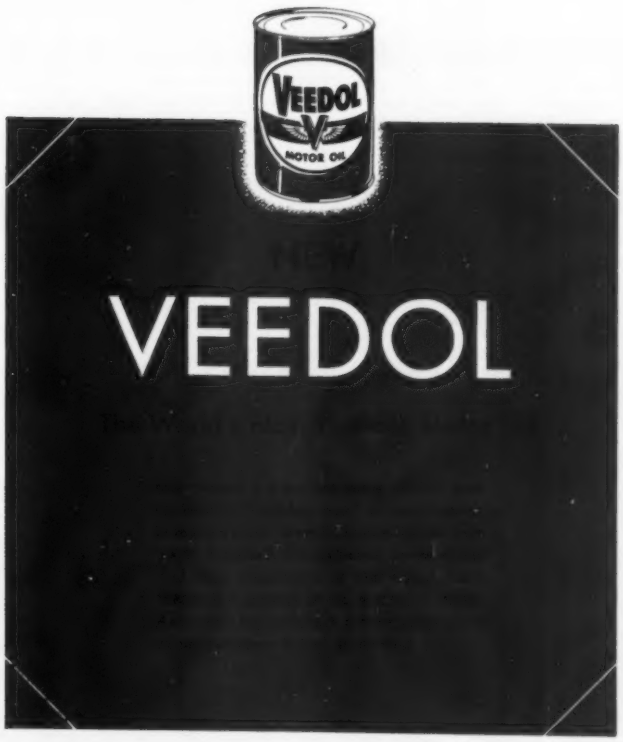
Four-Place Tonneau Sportster, designed by Richard Arbib for the VEEDOL "Dream Car" Salon.



FOUND

WHEREVER FINE CARS

TRAVEL



TIDE WATER
ASSOCIATED
OIL COMPANY

World Oil Production

(Continued from page 49)

Oil Co. (N. J.). A third part on long term availability at home and abroad, is being completed for the next meeting of the council in October.

Areas outside the United States, exclusive of Russian-dominated regions, had a capacity of 4,703,000 barrels daily last January, said the report, and actual production was 4,498,000 barrels daily. The capacity should rise to 6,092,000 and 7,139,000 barrels daily by 1955. The increase should come largely in Latin America and the Middle East.

While overseas expansion may be between 20 and 50 percent of the January, 1951 level, according to the report, the U. S. domestic increase is estimated at six to 20 percent. The domestic figure is significant because it serves to put to rest fears that the United States may have reached its peak in oil production, and be headed downward. In fact, the report says flatly: "Careful study of the prospects for future discoveries and development indicates that the present situation is about as promising as it was the beginning of 1946. The higher rate of production now does mean that there is a larger volume of normal decline which must be offset before drilling can increase availablity, but on the other hand, drilling is now at a much higher rate than in 1946."

The domestic forecast assumes drilling at the current rate, about 43,000 wells a year, and estimates that this would boost availability to between 7,789,000 and 8,838,000 b/d in 1955. This compares with last January's productive capacity in the United States of 7,300,000 b/d. Actual production then was 6,465,000 b/d and shut-in capacity 835,000 b/d. The estimated availability of crude and natural gas liquids in the United States for the next five years was estimated as follows by the committee:

	(Thousands of Barrels Daily)	
Year	Lower Range	Upper Range
1951	7,409	7,566
1952	7,596	8,007
1953	7,744	8,384
1954	7,781	8,627
1955	7,789	8,838

The estimate includes a production of 100,000 to 200,000 barrels daily from the tidelands or offshore lands, a figure which the report estimates will vary with the need for petroleum. Since offshore drilling is expensive, wells will be sunk only when there is a need for oil that cannot be easily met from other, more economical sources on land, it is believed. The study assumes settlement of ownership of the offshore lands, and says once this is achieved, about 1,000 wells will be drilled within the next five years on the continental shelf.

The report is based on certain assumptions, or conditions, which are called imperative if the job of finding and getting out the oil is to be accomplished. First of all, the industry must have the steel and other materials as well as the manpower to do the job. It must have fair tax laws, and this includes at home, the depletion allowance and intangible drilling credits. Abroad, a political and economic climate that welcomes oil capital is needed. The preservation of free markets, as opposed, for instance, to socialization and end use controls, is assumed.

Lane-Well Sales Meeting

Fifty-one management, sales, engineering, and operating representatives of Lane-Wells Co. met recently in Houston for a two-day conference. On hand to present current and future plans of the company were Rodney S. Durkee, president; Jas. D. Hughes, general sales manager; and Morton T. Higgs, manager of field operations. The sessions were under the direction of John J. Neale, Gulf Coast division manager, and R. M. Rutledge, Jr., Gulf Coast division sales manager.

Stainless Steel Handbook

A new data and handbook on the stainless steels has been published by Allegheny Ludlum Steel Corp. and is now available for free distribution to users of the heat and corrosion resistant metals. In its 120 pages the cloth-bound volume discusses approximately 40 different types of stainless steel and covers each type from standpoints of analyses, fabrication, heat treatment and special conditions of service. Copies may be obtained from the company's offices at 2020 Oliver Building, Pittsburgh 22, Pa.

Copper & Brass Bulletin

The August issue of the Copper & Brass Bulletin, publication of the Copper & Brass Research Association, celebrates, in six pages of text and pictures, the anniversary of the birth of the American petroleum industry 92 years ago near Titusville, Pa. Emphasis is placed upon the vital role played by the industry in peace and war through continued research and development of its facilities and the contributions of the copper industry to that development.

Vibrating Screen Catalog

A 20-page illustrated book No. 2377 on vibrating screens for dry-screening of light and fine materials, and separation of solids from liquids, has been published by Link-Belt Co. The book shows a variety of actual installations including reclaiming oil well drilling mud, and removing solids to avoid pollution of streams and waterways.

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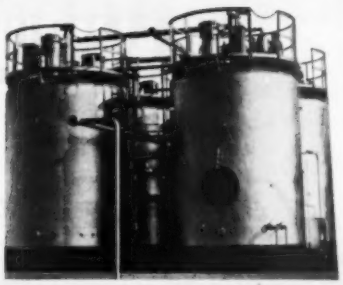

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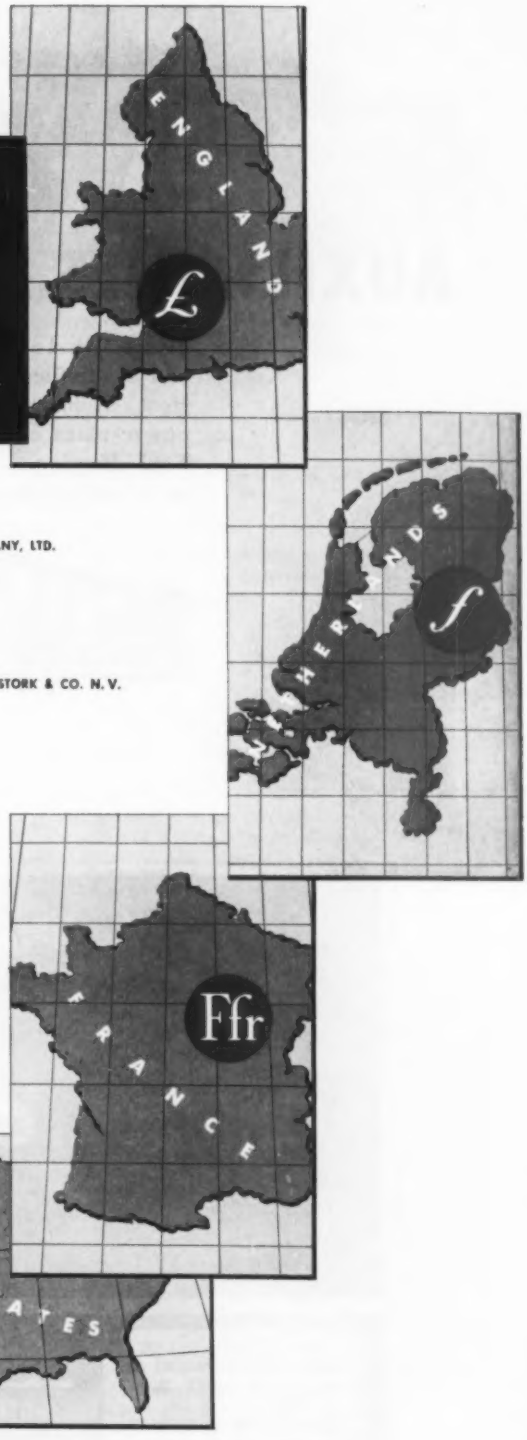

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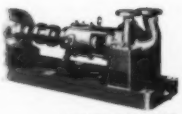
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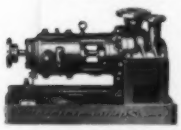
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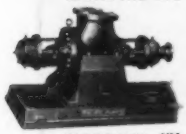
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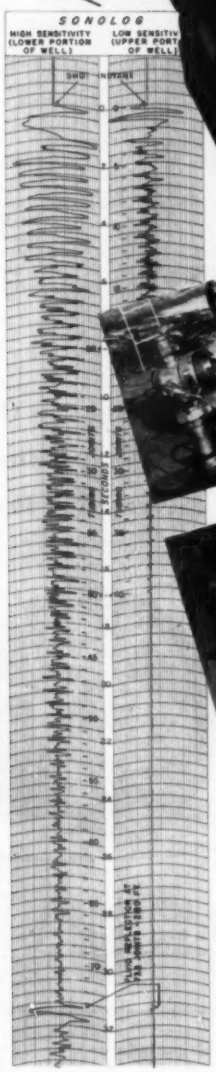

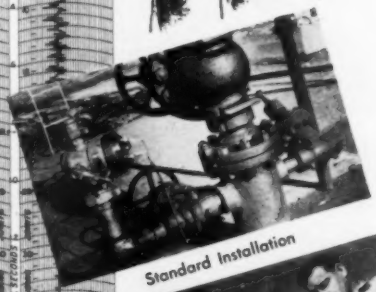

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High Pressure Installation

A PRECISION INSTRUMENT FOR MEASURING THE FLUID LEVEL IN PRODUCING WELLS BY THE ACOUSTIC METHOD

... for the purpose of determining bottom pressure
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... for analysis of operational difficulties such as defective pump or tubing.

SONOLOG provides two entirely separate recording channels operating simultaneously at different sensitivities and with different characteristics.... a feature that greatly aids in securing reliable data.

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... is a rugged instrument
... is simple to operate and maintain
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SONOLOG IS EASY TO USE

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... Recordings may be obtained on twenty or more individual wells per 8-hour working day.

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Thereafter, per month	150.00

By prior arrangement, a portion of all rentals paid or due may be applied against the purchase of complete equipment.

Typical log obtained from one shot and accompanying echoes down well. Two sensitivities permit amplification of impulses as they become dampened farther down well, enabling fluid level to be accurately determined.

SPECIFICATIONS

FORM: Strictly portable. Sturdy construction. May be carried by one person or in any conveyance. WEIGHT: Amplifier-Recorder . . . 70 pounds, Well Head Attachment . . . 30 pounds. POWER: Automobile or any 6-volt battery. RECORDING: Instantaneous ink-on-paper. Eliminates camera, film and developing process. Log available for immediate inspection. PRESSURE RATING: Pressure rating of Well Attachment 1500 psi. (A Well Attachment rated at 5000 psi is available at extra cost.) OPERATOR: One man only. No knowledge of electronics required for operation. DELIVERY: Immediate.

PURCHASE PRICE

Complete Equipment, including well head attachment, amplifier-recorder, microphone cable, power cable, 2" male union, cartridge rings, orifices, wrenches, record counter and supply of recording paper, ink, blank cartridges, microphones, cleaning brushes, and operating manual.

Terms: Net F.O.B., Houston, Texas.....$3250.00

KEYSTONE
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Oil Industry Provides Sulfur Beyond Its Own Requirements

According to a statement released by Deputy Petroleum Administrator Bruce K. Brown, the petroleum industry is presently producing 5,500 tons of sulfur more than it requires for its own use. Plans for increased production will soon add 190,000 tons to the nation's supply of this critical material, it was stated. The petroleum industry itself is a major consumer of sulfur. In 1950 it took over 12 percent of United States consumption of sulfuric acid.

Industry sources estimate 1951 gross requirements at 638,000 tons. Through acid recovery and sulfur extraction operations the industry is reclaiming the equivalent of 170,000 long tons of sulfur. The equivalent of another 133,000 long tons will be derived from spent acids and acid sludges. These are sent to other industries for direct use in fertilizer manufacture or for the production of sulfuric acid. The chemical industry takes the equivalent of 340,500 long tons of hydrogen sulfide. This total of 643,500 tons is 5,500 above estimated requirements of the industry. Through the installation of sulfur reclaiming units in refineries it is expected to add another 190,000 tons in 1952 bringing oil's contribution to other industries up to 195,000 tons or more.

Oil Progress Week Booklet

An attractive full-color booklet which describes the workings of the American petroleum industry in easy-to-understand language, has been produced by the Oil Industry Information Committee for distribution by oil companies during Oil Progress Week, Oct. 14-20. The booklet is entitled "Oil Serves You." It tells of the work that must be done, and the amazing total of men and materials employed in moving oil from subterranean depths to America's 150,000,000 consumers. A foreword points out that the task requires 2,000,000 men and women working at some 4,000 different jobs.

Socony Orders Two Tankers

Socony-Vacuum Oil Co. Inc., has ordered two new tankers which, when completed, will be larger than any others in the company's fleet. Socony-Vacuum currently operates 55 deep-sea tankers in world wide shipping through ownership or longterm charter.

One of the tankers will be built by the Sun Shipbuilding and Dry Dock Co. at Chester, Pa., with delivery scheduled for Dec. 1952. The other will be built by the Bethlehem Shipbuilding Co. with delivery scheduled for about the same time.

The vessel to be built by Sun Shipbuilding will have 30 cargo compartments with a capacity of 250,500 barrels, an increase of 31,500 barrels over each of the seven "super-tankers" completed last year. This vessel's length will be 641 feet from bow to stern. It will have a depth of 45 feet, draft of 34 feet and deadweight of 30,000 tons.

The vessel from Bethlehem will have a capacity of 254,800 barrels, a length of 644 feet, depth of 44 feet, draft slightly less than 33 feet, and a deadweight of 29,250 tons, compared with 27,000 tons for the earlier "super-tankers." Both vessels will have a speed of 16½ knots and a breadth of 84 feet. Each will carry a crew of 70, including 14 officers.

Cyanamid Builds $3 Million Plant

American Cyanamid Company's new $3 million catalyst plant at Michigan City, Ind., is now in production. The product is of microspheroidal type, the beads measuring about two thousandths of an inch in diameter, one pound of which offers about 55 acres of active surface.

"Packaged Power" Bulletin

General Electric Co., Schenectady, N. Y. has published a new 24-page bulletin, GEA-5600, outlining methods of obtaining a more flexible and efficient electrical system through the use of "package" units comprised of standardized components which eliminate the need for individually-engineered assembly of piecemeal components.

Opens Tulsa Engineering Office

Arthur G. McKee & Co. has opened an engineering office at Tulsa, Okla. to serve the company's customers in the southwest. Other company engineering offices are at the Cleveland, Ohio, headquarters and at Union, N. J. The Tulsa office will be headed by R. P. Mase who has been the company's southwest sales representative and who formerly was chief engineer of the Jones and Laughlin Supply Co., engineering and construction division at Tulsa.

Ohio to Enlarge Refinery

An eighteen month's program of construction and modification of refining units at the Ohio Oil Company's Robinson, Ill., refinery will boost that plant's capacity from 30,000 to 40,000 b/d. New units include a 6,000 b/d coking unit and a 7,000 b/d catalytic reforming unit. In addition, refined products terminals will be constructed at Toledo, Ohio, and Mt. Vernon, Ind., to receive products piped from the Robinson refinery.

New Bethlehem Store at Abilene

Bethlehem Supply Co. has opened a new store at Abilene, Texas. The Cisco, Texas store will be combined with the new Abilene store, thus giving improved service to the petroleum industry in the Abilene area. C. A. (Chuck) Pigg, who has been in charge of the Cisco store, will be store manager and field representative. He will be assisted by S. J. (Sid) Donalson, Jr., and J. S. (Jess) Weaver.

Griscom-Russell Moves to Ohio

In a move to centralize administration, general sales, engineering, development and other departments of its organization, The Griscom-Russell Co. moved its general offices from New York City to Massillon, Ohio, on September 1. The office at 285 Madison Ave. in New York will continue to operate as one of the company's regional sales offices.

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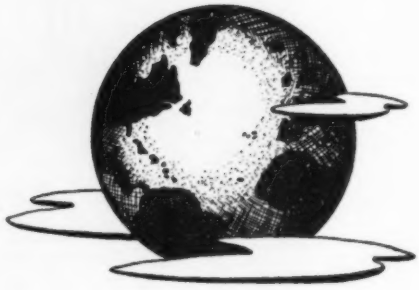

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US 36

Louis D. Mann

LOUIS D. MANN has been elected president of Cities Service Refining Corp. to succeed Burl S. Watson who was recently made chairman of the corporation's executive committee. Mr. Mann is a veteran Cities Service executive. He started with the organization in 1917 as a chemist and advanced rapidly through various refinery positions. During World War II he was manager of the Cities Service Defense Corp., Maumelle Ordnance Works at Little Rock, Ark. Since 1946 he has been vice president and general manager of Cities Service Refining Corp. which operates the Tutwiller refinery at Lake Charles, La.

Poland Plans 200,000-Ton Production

During the first quarter of 1951, Poland released a district in its eastern part to the Soviet Union, and received an area of almost the same size in return. This exchange was supposed to straighten out the economic boundaries between these states. While the Soviets received the entire Vojvodshaft district, the Poles received the area around Drohubycz, a former Polish province, which was captured by the Soviets in 1945.

This area, located in the eastern part of the Province of Galicia, contains oil deposits, which are now reunited with the Polish oil fields as they were in 1938. Production now is scheduled to reach 200,000 metric tons during 1951, and as much as 250,000 tons during 1952. During the first quarter of 1951, the Polish oil industry was able to fulfill 92 percent of the plan.

Saskatchewan Gas Discovery

A major gas find has been made at the Royalite Albercan Smiley No. 1 well about four miles south of Coleville, Saskatchewan. The well is rated at 10 million cubic feet open flow per day from the viking sand. Coleville is about 120 miles west of Saskatoon. Spudded in on Aug. 4, the well is 3,000 feet in depth. This find compares very favorably with Albercan's gas strike at Sibbald, Alberta, last fall.

Exploration Increases

Total number of exploratory oil wells reported drilling in Saskatchewan climbed to a new high of 19 in the week ending August 11, according to the weekly oil report issued by the Saskatchewan department of natural resources. Previous exploratory drilling record was 15.

Imperial Earnings

Imperial Oil Ltd.'s consolidated net earnings, after income tax, for the first half of 1951 are estimated at $18,120,860, or 66.8 cents per share, compared with $10,975,499, or 40.5 cents per share, for the corresponding period last year. Products sales have increased by approximately 16 percent and crude production was greatly enlarged.

Smith Joins Merritt-Chapman & Scott

Earl C. Smith has joined Merritt-Chapman & Scott Corp. as a sales engineer. He will work under Myles C. McGough, vice president in charge of industrial and building construction. Mr. Smith was most recently associated with Brown & Root, Inc., of Houston, Texas, as a sales engineer. From 1939 to 1947 he was with the Lummus Co., of New York, as a job and project engineer.

Gift to Stanford

A gift received by Stanford University from Henry Salvatori, president of Western Geophysical Co. of America, will be used to equip a geophysical laboratory at Stanford. The laboratory will be located in the Petrography Building and will be named in honor of the donor. It will be used to investigate mineral resources through a study of the physical properties of the earth's crust. Mr. Salvatori also is lending the university laboratory equipment and is helping to finance an additional professorship in geophysics.

Buys Olson Properties

Producing properties of Olson Drilling Co., Tulsa, have been purchased by San Juan Oil Co., Dallas. Transaction involved 140 wells bringing San Juan's properties to 475 wells producing 5,000 b/d. Robert J. Bradley, formerly with DeGolyer and MacNaughton, is president.

T. A. Atkinson E. S. Hochuli

THOMAS A. ATKINSON has been named assistant manager of Rocky Mountain operations for the General Petroleum Corporation's production department. He will be located in Casper, Wyo., where General Petroleum production operations are headed by A. F. Barrett. Edward S. Hochuli succeeds Mr. Atkinson as manager of the industrial relations department at Los Angeles.

Mr. Atkinson first worked for General Petroleum as a high school boy in 1926. He held intermittent jobs with the company while attending the University of California. In 1938 he was assigned to engineering work and became assistant to the southern division superintendent of the production department in 1944.

Humble and Phillips to Build Plant

Humble Oil and Refining Co. and Phillips Petroleum Co. will build a large natural gasoline plant in the Spraberry sand development in the Permian Basin south of Midland, Texas. The plant will serve portions of Midland, Upton, Glasscock, and Reagan Counties as rapidly as completion of wells justify. Both companies have extensive holdings in the area and expect to process casinghead gas from others. Outpost wells already drilled indicate the plant may serve an area of more than 100,000 acres. Tentative location will be north of the Pembrook field. Phillips will extend its products gathering line from its recently launched Spraberry plant some 20 miles to the north.

To Complete Colomo No. 2

Pemex will complete Jose Colomo No. 2, State of Tabasco, in the near future. This well is being closely watched since it is an offset to the discovery well in the new field brought in by Pemex earlier this year. The discovery well had an initial production of 1,700 barrels per day on choke.

Latest reports indicate that No. 1 test has increased its production without the choke being opened. This is the find which brought forth the enthusiastic statement from Pemex director Antonio J. Bermudez that "this is the Venezuela of Mexico."

Bulgaria Confiscates Motor Vehicles

All Bulgarian motor vehicles have been confiscated, private ownership abolished, and cars ordered into nationalized motor pools, from which all categories of nationalized trade, industry, and agriculture may apply for a truck, a car, or a tractor. Despite heavy control over the vehicles' use for the sake of saving gasoline and the vehicles themselves, there is not enough fuel available. Bulgarians are using wood and charcoal generators to drive cars and trucks. Neighboring Romania would have enough oil products for sale, but is not willing to sell for any other currency than US dollars.

Caltex to Build in Lebanon

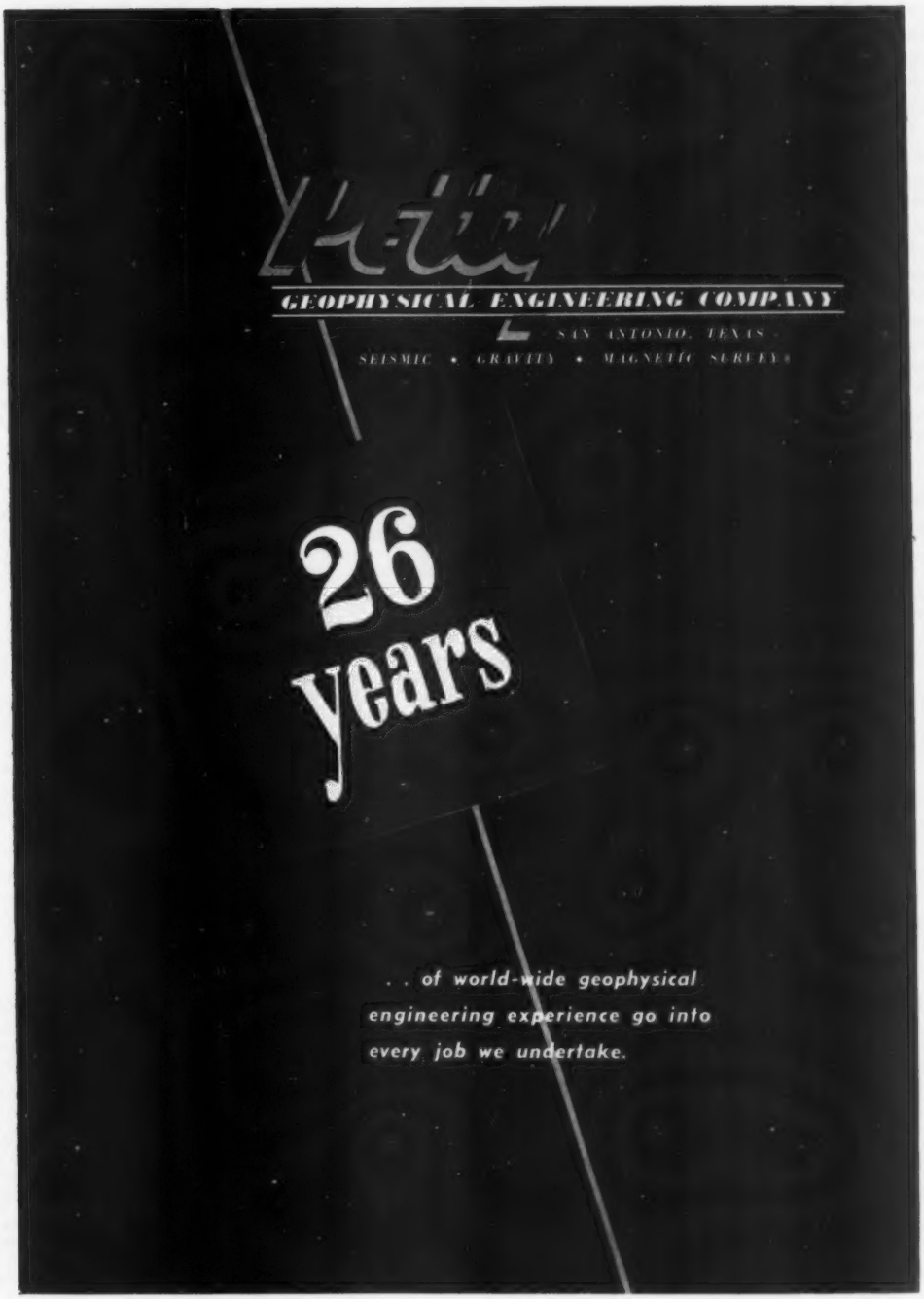
California Texas Oil Co., Ltd., will build a 13,000-barrel refinery near Sidon, Lebanon, at the western terminus of the Trans-Arabian pipe line. The plant will be designed to produce petroleum products required for domestic consumption in Lebanon plus diesel and fuel oils for Caltex bunkering.

Cost of the plant has been estimated at $5,800,000. Completion is scheduled for the autumn of 1953. Contracts have not been let as yet.

W. D. C. MACKENZIE, assistant manager of Imperial Oil's western producing division for the past three years, has been appointed manager of the division. He succeeds R. B. Curran, resigned.

Mr. Mackenzie is a native of Alberta. He was graduated from the University of Alberta in 1935 and the following year joined Imperial's geological department at Calgary. In 1937 he took charge of sub-surface geological work in the Turner Valley field. In 1942 he joined the Canol project working with the U. S. government. After the war he became chief engineer of the company's producing department and in 1948 was appointed assistant manager of the western producing division.

W. D. C. Mackenzie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Deep Rock Opens New Offices

Deep Rock Oil Corp. has opened two new regional exploration offices. Oklahoma activities have been consolidated at Oklahoma City under Area Geologist O. E. Gram and Landman L. L. Crozier. Charles D. Moore has joined the staff as geologist. Charles W. Lane has been appointed technical and administrative assistant to the vice president at Tulsa, I. S. Higginbotham being named new assistant to the geology manager.

Moving to Wichita to reopen company offices is Robert D. Gensch, former Tulsa area geologist. Kenneth Holke, recently with Cooperative Refinery Association, joins the new office as assistant geologist.

Insulation Booklet

The Pittsburgh Corning Corp., Pittsburgh, Pa., has published a new booklet entitled "Foamglas Insulation For Piping and Process Equipment" which lists the properties of Foamglas. It gives typical data for cold, intermediate and hot applications; details for insulating tanks, ducts, removable covers and tank heads; accessory materials; prominent users; and distributors.

ANTONIO MARTINEZ BAEZ, Mexican Economy Minister, recently visited Ottawa, Canada, in an attempt to sell Petroleos Mexicanos' new 140-ton-a-day Poza Rica sulfur production to Canadian newsprint manufacturers in return for a larger Mexican paper quota. At the same time, the Economy Ministry which he heads announced the ceiling price of sulfur has been boosted from 250 to 270 pesos ($33.75) per ton.

JOSE COLOMO, assistant director of Petroleos Mexicanos, has returned to Mexico after a two-month tour of Europe during which he attended the World Petroleum Congress at The Hague. Private reports indicate Colomo also signed several contracts to purchase pipe and other equipment in France and Germany but no specific details have been given out.

BEN S. SMITH, JR., has been named director of industrial relations for Lion Oil Co. succeeding John W. B. Foringer, resigned. Mr. Smith joined Lion in 1937, at the time the company acquired the assets of E. L. Smith Oil Co. of Mexia. He has been an assistant personnel director since 1947.

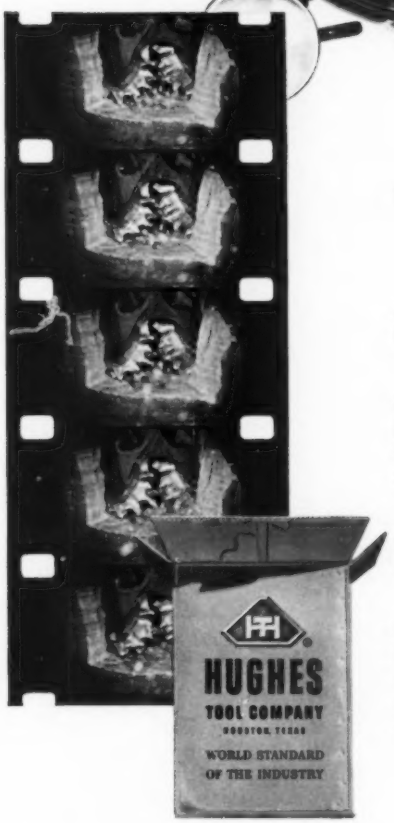
Du Pont Promotions

David H. Conklin was appointed assistant director of sales of Du Pont's petroleum chemicals division today with direct responsibility for district sales offices. Joseph L. Stecher will continue as assistant director of sales of the division in direct charge of products and services.

It was announced at the same time that Charles Wirth III, manager of the New York district office of the division, has been made manager of wholesale sales in the kinetic chemicals division of the company's organic chemicals department. Pending appointment of Mr. Wirth's successor, the New York office will be in charge of E. Hearn Simpson, petroleum chemicals sales manager.

Named Chief Inspector

John E. Ward, a member of The Youngstown Sheet and Tube Co. for 23 years, has been appointed chief inspector for the Youngstown district. He succeeds Lewis W. Fogg, Jr., who died May 14. Mr. Ward joined the company in 1928 as an inspector and became assistant chief inspector May 16, 1944. He is a member of the American Petroleum Institute.



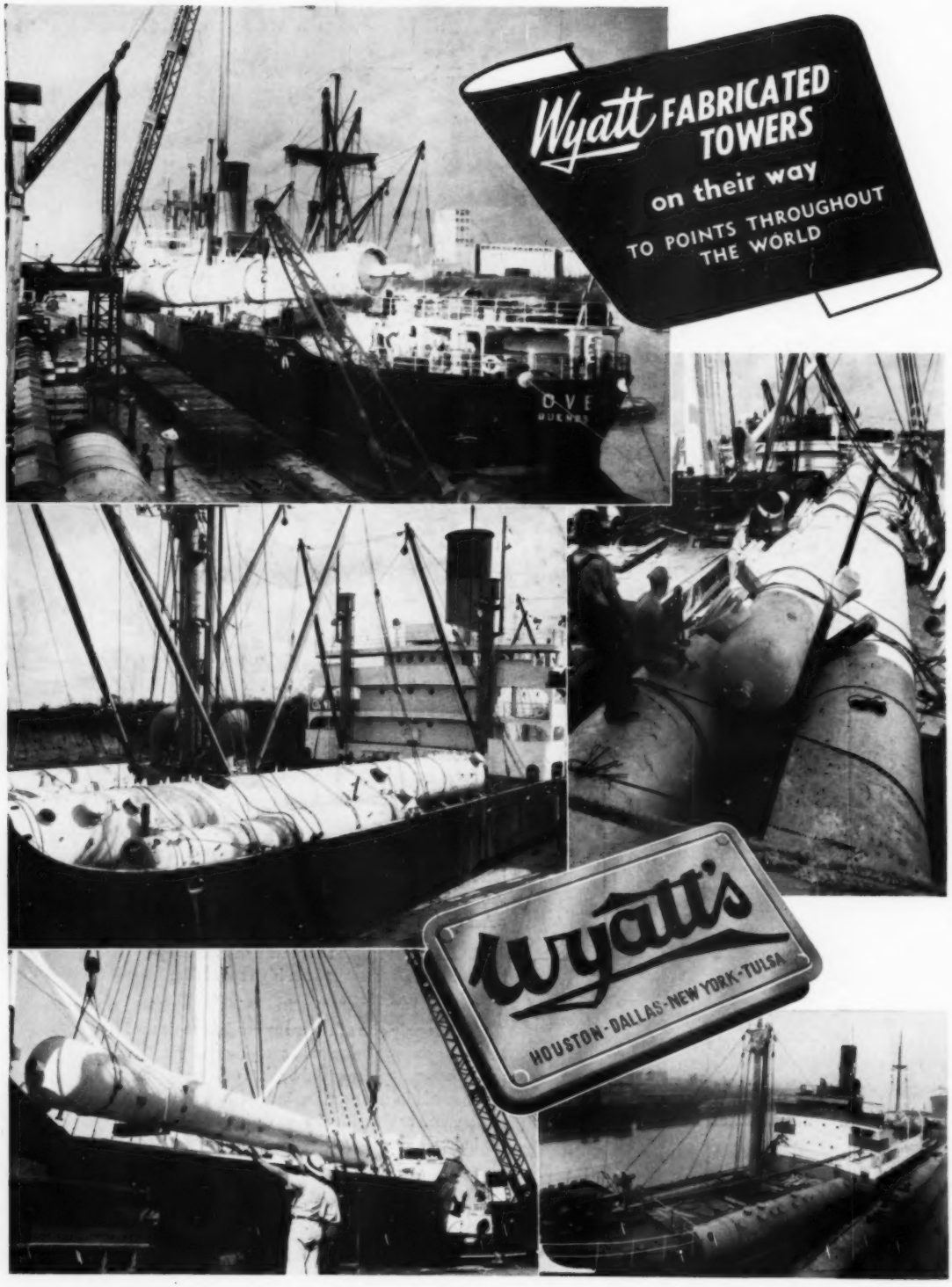
BIT ACTION IN *SLOW MOTION*

Motion pictures, taken at 3000 frames per second—*100 feet in two seconds*—are being used to study bit performance at the Hughes research laboratory.

Focused on a bit drilling in a test block, the high speed camera records, in the slowest of slow motion, just how the bit teeth bite into the formation… shows the effect of tooth structure, tooth spacing and other design features on drilling efficiency.

Details, impossible to see with the naked eye, become crystal clear when the high speed film is projected on the screen.

This is only one of the many modern tools used by Hughes research engineers in studying rock bit performance. Supplemented by data obtained from millions of bits run on thousands of rigs, this research information enables Hughes to design and build the industry's best rock bits.


Wyatt FABRICATED TOWERS
on their way
TO POINTS THROUGHOUT THE WORLD
Wyatt's
HOUSTON-DALLAS-NEW YORK-TULSA